

**FINAL
SEMI-ANNUAL OPERATIONS,
MAINTENANCE AND MONITORING
(OM&M) REPORT
OCTOBER 2006 THROUGH MARCH 2007
WASTE DISPOSAL, INC. SUPERFUND SITE
SANTA FE SPRINGS, CALIFORNIA**

Prepared for

United States Environmental Protection Agency

Prepared by

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On Behalf of

Waste Disposal, Inc. Group (WDIG)

August 2007

August 31, 2007

Project No. 98-101

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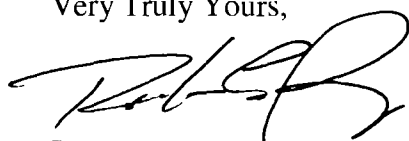
Transmittal
Final
Semi-Annual Operations, Maintenance, and Monitoring
Status Report (OM&M)
Waste Disposal, Inc. Superfund Site
Santa Fe Springs, California

Dear Russell:

Enclosed please find a copy of the Final Semi-Annual Operations, Maintenance, and Monitoring Status Report (OM&M) for the Waste Disposal, Inc. (WDI) Superfund Site in Santa Fe Springs, California. This document satisfies the requirements for reporting of the Final Operations, Maintenance, and Monitoring Plan (OMMP), date August 2006.

If you have any questions or comments, please call Ken Floom at (949) 374-0913 or me at (714) 388-1802

Very Truly Yours,



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1.0 INTRODUCTION

1.1 INTRODUCTION AND PURPOSE

1. This Semi-Annual Operations, Maintenance, and Monitoring (OM&M) Report provides a summary of operation and maintenance activities and monitoring results of the soil gas, in-business air, ambient air, reservoir gas collection system, leachate collection, ground water and stormwater monitoring data collected by the Waste Disposal, Inc. Group (WDIG) during the First and Second Quarters of 2006-2007 (the reporting period) at the Waste Disposal, Inc. (WDI) Superfund Site (Site) in Santa Fe Springs, California. The annual OM&M period spans from October 1 of each year to September 30 of the following year since the Final Combined Construction As-Built, Construction Completion and Remedial Action Completion Report was approved by EPA on September 14, 2006. This report is required under the Amended Statement of Work (SOW) of the Amended Administrative Order, Docket No. 97-09, for the Soil and Subsurface Gas Operable Unit at the Site (Environmental Protection Agency [EPA], 1997a). The OM&M activities were performed pursuant to the Final Operations Maintenance and Monitoring Plan (OMMP) by TRC dated August 2006 (TRC, 2006a). It has been prepared to meet the following objectives:

- Summarize operation and maintenance activities for the remedial systems performed during the First and Second Quarters of 2006-2007 by WDIG.
- Summarize the soil gas, in-business air, ambient air, reservoir gas collection system, leachate collection, ground water and stormwater monitoring data collected during the First and Second Quarters of 2006-2007 by WDIG.
- Evaluate the data as to trends or other observations.
- Provide a formal transmittal of laboratory and Quality Assurance/Quality Control (QA/QC) data to the EPA.

1.2 REPORT ORGANIZATION

1. The remaining sections of this OM&M Status Report are organized as follows:
 - Chapter 2.0 - Project Background
 - Chapter 3.0 - Summary of Operation and Maintenance Activities and Deviations from Long Term Operation and Maintenance Plans
 - Chapter 4.0 - Summary of Monitoring and Sampling Activities
 - Chapter 5.0 - Monitoring Results
 - Chapter 6.0 - Quality Assurance/Quality Control
 - Chapter 7.0 - Institutional Controls Monitoring and Enforcement Report
 - Chapter 8.0 - Conclusions and Recommendations
 - Chapter 9.0 - References

2.0 PROJECT BACKGROUND

2.1 SITE DESCRIPTION

1. The Site is located in Santa Fe Springs, Los Angeles County, California on an approximately 38-acre parcel of land. It is bordered on the northwest by Santa Fe Springs Road, on the northeast by the former Fedco Distribution Center and a private high school, on the southwest by Los Nietos Road, and on the southeast by Greenleaf Avenue (Figure 1).
2. The Site is comprised of 22 parcels. Various businesses are currently operating on 19 of the parcels; 3 of the parcels are currently vacant. Figure 2 shows the numbers and names of the owners of the parcels, and a summary of the existing businesses onsite is presented in Table 1.
3. The Site was conceptually divided into eight areas (Area 1 through 8) based on previous uses and conditions during the initial Remedial Investigation/Feasibility Study (RI/FS) period as shown in Figure 2. A 42-million-gallon-capacity crude oil reservoir is buried in the central portion of Area 2. The north corner of Area 2 is used for recreational vehicle (RV) and other storage. The remaining portion of Area 2 is undeveloped. Area 1 (located along Santa Fe Springs Road) and Area 8 (located along Los Nietos Road) contain most of the light industrial complexes and small commercial businesses that are present on the Site. Areas 3 through 7 extend along Greenleaf Avenue. Areas 3 and 4 are undeveloped and are the closest property boundary to nearby residential areas (approximately 50 feet). The building located in Area 5 is used for a light industrial business. Areas 6 and 7 are unoccupied and generally vacant, although there are a couple of concrete foundations that remain from previous structures.

2.2 GENERAL SITE HISTORY

1. The reservoir was used for crude oil storage during the Santa Fe Springs oil field development from 1924 to some undetermined time, probably in the 1930's. During this period, various activities were being performed outside the reservoir, including the storage and mixing of drilling muds. It is inconclusive from aerial photograph review whether waste disposal activities were being systematically carried out during this period.
2. Beginning in the late 1940's to early 1950's, the Site was used for disposal of a range of waste and solid fill materials. After 1949, waste disposal activities were regulated under permit from Los Angeles County, Department of Sanitation until facility closure in 1964. Reliable documentation on disposal was not maintained. As a result, a comprehensive

history of Site disposal practices or accepted waste is not available. However, permitted waste included the following: rotary drilling muds; clean earth, rock, sand and gravel; paving fragments; concrete; brick; plaster; steel mill slag; dry mud cake from oil field sumps and acetylene sludge. Investigations have shown that disposed material also included organic wastes, oil refinery waste, solvents, and waste chemicals. Wastes were disposed primarily within the reservoir boundary and in bermed areas surrounding the reservoir. However, field investigations and aerial photograph analyses indicates occurrence of wastes throughout most of the Site.

3. In 1953, the Site began receiving fill material to cover the Site including the reservoir area and unlined bermed disposal pits. The filling of the reservoir area continued until approximately 1966 when grading of the Site was completed.
4. The WDI Site was placed on the National Priorities List (NPL) in July of 1987. In 1988, the EPA initiated a removal action program. During the years 1988 to 1993, EPA performed a RI/FS (EPA, 1993a) which led to a selected remedy for the Site presented in the Record of Decision (ROD) (EPA, 1993b).
5. The Settling Defendants for the Site (a Group of Potentially Responsible Parties who carry out the requirements of the ROD under the Site orders and decrees) organized the WDIG. The WDIG conducted a series of predesign field investigations and treatability studies during 1995 through 2001 under Administrative Order (AO) 94-17 and Amended Administrative Order (AAO) 97-09. The results of these activities were reported in the Remedial Design Investigative Activities Summary Report (Revision 2.0) (TRC, 2001a). After incorporating comments from the EPA and California Department of Toxic Substances Control (DTSC), the report was approved in June 2001.
6. The predesign field investigations changed the conceptual model for the Site and identified additional conditions to those considered for selection of the remedy incorporated in the ROD. Therefore, a Supplemental Feasibility Study (Revision 4.0) (SFS) (TRC, 2001b) was prepared in 2001. Based on results of the SFS, the EPA selected a revised remedy, which was incorporated in the Amended Record of Decision ([AROD], EPA, 2002). A Remedial Design was prepared to construct the remedy presented in the AROD, and the Final (100%) Remedial Design Report (TRC, 2003) was approved by the EPA in June 2003.

7. During development of the AROD, the EPA and WDIG negotiated a Consent Decree (CD) for the implementation of the remedial design. The CD was filed in the United States District Court, Central District of California in 2003 (EPA, 2003). A Compliance Testing Plan (CTP; TRC, 2005) and Compliance Testing Report (CTR) were additional deliverables required under the CD.
8. The implementation of the remedial design at the Site was initiated in March 2004 and the remedial design construction work was performed according to the Final (100%) Remedial Design Report (TRC, 2003), Final Remedial Action Workplan (RAWP) (TRC, 2004) and associated management plans. The remedial construction work has been completed and all construction activities performed onsite were documented in the Construction As-Built Drawings in the Combined Construction Completion Report (TRC, 2006b). The major Site remedial and monitoring systems include:
 - Resource Conservation and Recovery Act (RCRA) Subtitle C-Equivalent Cover
 - RCRA Subtitle D-Equivalent Cover
 - Surface Drainage Control System
 - Gas Migration Control Systems
 - Reservoir Gas Collection System
 - Building Modifications
 - Sentinel Biovent System
 - Leachate Monitoring/Control System
 - Soil Gas Monitoring System
 - Vapor Monitoring Wells
 - Surface Emissions Monitoring
 - Ground Water Monitoring System
 - Stormwater Monitoring System

The major remedy components are shown in Figure 3.

9. The Compliance Testing Plan (TRC, 2005a) described the monitoring and testing requirements and procedures followed for sampling and monitoring during the compliance testing period. The compliance testing period was conducted from December 17, 2005 to January 17, 2006. The Final Compliance Testing Report (TRC, 2006c) was submitted in June 2006 and approved by EPA on July 27, 2006.
10. Formal OM&M activities began on September 15, 2006. This Semi-Annual OM&M Report provides a summary of the operations and maintenance activities and evaluation of the soil

gas, in-business air, ambient air, reservoir gas collection system, leachate collection, ground water and stormwater monitoring data collected during the First and Second Quarters at the Site. This report is required under the SOW of the Amended Administrative Order, Docket No. 97-09, for the Soil and Subsurface Gas Operable Unit at the Site (EPA, 1997a).

2.3 SITE CONDITIONS

1. Soil borings were drilled at the WDI Site for geologic logging and chemical characterization during three primary periods of investigation: the 1988 Remedial Investigation (RI) conducted by EPA and the 1997 and 2002 Remedial Design Investigations conducted by both EPA and WDIG. Constituents detected in waste include volatile organic compounds (VOCs), primarily benzene, toluene, ethylbenzene, and xylenes (BTEX); semi-volatile organic compounds (SVOCs); and heavy metals such as arsenic, chromium, copper, and lead. Waste and contaminated soil have been identified throughout Area 2, which contains the buried reservoir, and in portions of Areas 1, 4, 5, 6, 7, and 8 where other buried wastes have been found.
2. The Remedial Design Report provides a delineation of the buried waste extent. Figure 2 shows the locations of the various parcels, what businesses are located on them, and the limits of the waste. Site investigations have shown that 11 of the 22 parcels have structures located over buried waste; 8 other parcels have structures, but waste was not identified underlying the structures. The three unoccupied parcels have underlying waste, but no structures. The buried waste and impacted soil ranges in thickness from an average of approximately 5 to 10 feet to a maximum of 20 feet.
3. Soil gas "hot spots" are present in the subsurface (vadose zone) within and outside the reservoir (i.e., Area 2) in several locations on the Site, including shallow fill soils, buried waste material, and deeper native soils. The "hot spots" are characterized by elevated levels (e.g., exceeding EPA preliminary remediation screening levels) of BTEX, methane, petroleum hydrocarbons, and chlorinated VOCs in soil gas. The primary VOC constituents detected are methane, benzene, vinyl chloride, trichloroethene (TCE), and tetrachloroethene (PCE).
4. Multiple investigations have indicated the presence of perched liquids and/or leachate both within the reservoir. Liquids were encountered within the reservoir at depths ranging

between 4 and 12 feet below grade (fbg). The liquids/leachate were found to contain Comprehensive Environmental Response, Compensation and Liability (CERCLA) hazardous substances, including but not limited to VOCs, such as benzene, toluene, ethylbenzene, and vinyl chloride; SVOCs; polychlorinated biphenyls (PCBs); and metals such as arsenic, chromium, and lead.

5. A description of the regional ground water conditions and hydrogeology is included in the AROD. Evaluation of the Site ground water data indicates that the primary VOCs detected are PCE and TCE at concentrations less than 20 micrograms per liter ($\mu\text{g/L}$). These VOCs have been detected only in the western portion of the Site. Based on ground water flow conditions, the distribution of detections, and information on offsite ground water contamination sites, the sources of the PCE and TCE detected in the monitoring wells in the western portion of the WDI Site appear to be from solvent releases associated with upgradient industrial sites and/or other sources. Elevated concentrations of aluminum, iron, manganese, and selenium have also been detected in ground water samples; in some cases above primary or secondary drinking water standards. The fact that these metals are detected uniformly across the Site suggests that the concentrations reflect regional water quality conditions and are not related to onsite sources.

2.4 SUMMARY OF SITE MEDIA CHARACTERIZATION

2.4.1 SOIL GAS CHARACTERIZATION

1. Initial soil gas characterization work was performed by EPA in 1988 during Remedial Investigation Activities (EBASCO, 1989).
2. Supplemental soil gas investigative activities were conducted by WDIG and the EPA during 1997 and 1998, under the Remedial Design Investigative Activities Workplan (TRC, 1997) and the Subsurface Gas Contingency Plan (EPA, 1997b). Activities included geoprobe soil gas screening, two soil gas monitoring events, in-business air monitoring, the installation of 32 vapor wells by WDIG and the EPA in 1998 and completion of 24 soil gas monitoring rounds from 1998 to 2003. Figures 3 and 4 shows the existing vapor well locations after completion of remedial construction activities.
3. Primary objectives of the current soil gas monitoring activities are:
 - Determine current soil gas conditions in the following areas:
 - Site perimeter (Compliance Vapor Wells).
 - Adjacent to onsite structures (Non-Compliance Vapor Wells).

- Site interior (Non-Compliance Vapor Wells).
 - Determine trends in the historical data.
 - Evaluate if other compounds not assigned site-specific action levels pose a Site risk.
4. Interim Threshold Levels (ITLs) for benzene and vinyl chloride, which were established as part of the Subsurface Gas Contingency Plan (EPA, 1997b) and the Amended Administration Order Docket 97-09 (EPA, 1997a), are based on the potential migration of subsurface gas into onsite businesses. A more detailed description of the rationale for these ITLs is provided in the Amended Administrative Order and the Subsurface Gas Contingency Plan (EPA, 1997a and 1997b).
 5. To address the risks from methane, EPA used the California Integrated Waste Management Board's (CIWMB's) methane action level in buildings as their criteria:
 - Methane levels in buildings will be below 1.25% (i.e., 25% of the methane lower explosion limit of 5%).
 - Subsurface methane levels at the Site boundary must be below 5% based on CIWMB requirements. An ITL of 1.25% was used by EPA in evaluating the results of the Subsurface Gas Contingency Plan Investigations Report (CDM Federal, 1999a).
 6. As part of the Soil Gas Contingency Plan work, referenced in paragraphs 2 and 4 of this section, EPA developed ITLs for the chemicals determined to present potential health risks based on chemical toxicity and relative concentrations at the Site. Subsequent to establishing the ITLs, EPA adopted standards for soil gas as part of development of the AROD. The soil gas standards are for comparison with gas concentrations in the subsurface. Table 2 provides a summary of the updated soil gas performance standards (SGPSs). Table 2 also provides a summary of the updated indoor air threshold levels (IATLs) for the Site Chemicals of Concern (COCs). The IATLs are for comparison with concentrations of gas constituents measured in Site buildings (i.e., in-business air) and ambient air, as described in Section 2.4.2.

2.4.2 IN-BUSINESS AND AMBIENT AIR CHARACTERIZATION

1. The objective of in-business air monitoring is to assure that soil gas from the Site is not infiltrating into onsite buildings. Figure 4 shows the existing in-business and ambient air locations after completion of remedial construction activities.

2. The in-business air sampling was initiated in February 1998. Results from the first 3 months of monitoring indicated that soil gas infiltration was not occurring. Based on those results, monitoring was reduced to quarterly, concurrent with the vapor well monitoring program, which continued through 2000. With EPA's concurrence, semi-annual monitoring began in 2001. Semi-annual monitoring was discontinued prior to the remedial construction activities. Routine quarterly monitoring was initiated with the OM&M activities.

2.4.3 RESERVOIR GAS CHARACTERIZATION

1. The Reservoir Gas Collection System, which is the active treatment component of the gas migration control system, collects and treats gas from the reservoir area underneath the RCRA C-equivalent cover. The engineering details of the Reservoir Gas Collection System are available in the Final (100%) Remedial Design Report (TRC, 2003a) and Final RAWP (TRC, 2004a). Figures 3 and 4 shows the location of the Reservoir Gas Collection System.
2. Performance requirements for the Reservoir Gas Collection System are mainly developed to meet the emission standards established by the South Coast Air Quality Management District (SCAQMD) as well as the Applicable or Relevant and Appropriate Requirements (ARARs) for COCs in subsurface soil gas.
3. During the compliance period, the system was monitored for compliance with the SCAQMD VOC emission rate standard of 1 pound per day, and the system performance requirement of reducing non-methane organic carbon (NMOC) by at least 98 percent by weight or reducing NMOC concentration to less than 20 parts per million volume (ppmv) dry basis as hexane at 3 percent oxygen.
4. Long-term performance requirements are monitored during the OM&M phase and include evaluation of the system function, which may be switched to passive treatment if an acceptable methane emission rate (i.e., methane emission rate less than 2.3 lb per day after 1 year) and quality requirements can be maintained at a passive treatment level.

2.4.4 LEACHATE CHARACTERIZATION

1. The performance requirements of the leachate monitoring/control system were determined from the monitoring requirements in the SOW (EPA, 1997a). The performance requirement for leachate accumulation in the control system wells is set at 12 inches, which means that the leachate accumulation in the wells shall not be greater than 12 inches in depth. If leachate accumulation exceeds 12 inches, it will be removed and disposed offsite. Monitoring of leachate level and procedures for removing excessive leachate are discussed in Section 3.5.
2. During the compliance period, the leachate accumulation in the leachate monitoring/control system was monitored weekly. During monitoring, liquid levels in the leachate collection wells were found to recover at a rate that required an increase in the monitoring frequency from weekly to bi-weekly. This monitoring frequency has continued through the first 6 months of OM&M. Figure 3 shows the locations of the Leachate Collection Wells installed as part of the remedial construction activities.

2.4.5 GROUND WATER CHARACTERIZATION

1. As part of the RI/FS process, 27 ground water wells were installed at the Site, with the majority of the wells screened at 1988 water table elevations. Four wells extend to about 50 feet below the water table. Two additional wells (GW-32 and -33) were installed in January 2001 by TRC. Several wells were subsequently closed to facilitate the remedial construction activities. Figures 3 and 4 show the ground water monitoring well locations remaining after completion of the remedial construction activities.
2. During irregularly spaced monitoring events from November 1988 through September 1997, the following ground water conditions were observed (CDM Federal, 1999a):
 - TCE and PCE exceeding Maximum Contaminant Levels (MCLs) (5.0 µg/L) found in wells located in the western portion of the Site.
 - Light nonaqueous phase liquids (LNAPL) and dense nonaqueous phase liquids (DNAPL) have not been observed in the ground water samples.
 - Primary metals (i.e., arsenic, chromium and lead) have been detected at low concentrations exceeding MCLs (0.05 milligrams per liter [mg/L] for arsenic, chromium, and lead) during isolated sampling events. These concentrations were observed in upgradient, cross-gradient and downgradient wells at the Site.
 - Elevated concentrations of aluminum, iron, manganese and selenium reflect a regional ground water condition, not a site-specific condition.

3. Subsequent monitoring events between 1997 and 2003 also reported similar findings.
4. The AROD (EPA, 2002) concludes that the Site has not contributed to the exceedances of ground water MCLs, based on extensive monitoring. Some contaminants are detected upgradient or laterally away from WDI waste sources and in relatively deep water bearing zones. Although several COCs (VOCs and metals) have been detected above their respective State drinking water MCLs in ground water samples, these exceedances do not appear to be related to Site wastes based on their distribution in ground water.
5. Ground water is monitored semi-annually as part of the current OM&M activities. The primary objectives of the Long-Term Ground Water Monitoring Plan are to establish a detection monitoring program for identifying changes in ground water elevation (to monitor changes in ground water velocity and flow direction) and potential releases, leaching, or migration of waste materials from onsite sources to the ground water. A further objective is to locate onsite background wells such that they can also be utilized to track the movement of contaminants from offsite sources.

2.4.6 STORMWATER CHARACTERIZATION

1. The stormwater pollution prevention plan (SWPPP) for WDI (TRC, 1998) has two major objectives. The first is to identify existing and potential sources of stormwater pollution at the Site, if any. The second is to propose and implement necessary practices that would reduce the introduction of potential pollutants into stormwater discharges associated with the Site if any are identified.
2. The SWPPP was designed to cover the undeveloped areas of the Site (Areas 2, 3, 4 and 7). The remaining areas (Areas 1, 5, 6 and 8) have existing or abandoned light industrial businesses, which are responsible for their own stormwater management practices.
3. Initially, a total of five stormwater monitoring points were designated. However, after completion of the remedial construction activities in 2006 and with EPA approval, the monitoring points were increased to six as shown in Figure 5.

3.0 SUMMARY OF OPERATION AND MAINTENANCE ACTIVITIES AND DEVIATIONS FROM LONG-TERM OPERATION AND MAINTENANCE PLANS

1. This section presents a summary of the O&M activities performed for the Site remedial systems during the first and second quarters of 2007. This section also identifies any deviations from the O&M Plan that were implemented during the period if any. The O&M activities include:

- Inspection of the RCRA Subtitle C-equivalent and Subtitle D-equivalent covers.
- Reservoir gas collection, venting and treatment system operation, inspection and carbon changeouts.
- Ground water and soil vapor monitoring well inspections.
- Biovent well inspections.
- Stormwater drainage system inspections.
- Monitoring of leachate levels and leachate removal.
- Landscape maintenance.
- Site security.
- Reporting.

The locations of major remedy components listed above are shown in Figure 3. Design and engineering details of the remedy components are available in the Final (100%) Remedial Design Report (TRC, 2003), Section 2.0 of the RAWP (TRC, 2004), and the Combined Construction Completion Report (TRC, 2006b).

2. The required O&M activities for the Site are described in the OMMP (TRC, 2006a). The OMMP identifies the inspection/monitoring frequency and includes the Inspection and Monitoring Data Sheets for the Site remedial systems identified above.
3. Tenants who may be affected by O&M or monitoring activities were notified at least one week in advance of the activities. The notifications were made by the WDIG Coordinator or the OM&M Supervising Contractor. The methods of notification included telephone, e-mail and/or direct contact. A list of current tenants or owner occupants is presented in Table 1, which has been updated as necessary to reflect changes in tenants and land owners that may occurred since the last reporting period.

3.1 INSPECTION OF RCRA EQUIVALENT COVERS

1. The performance requirements and frequency of O&M activities for the RCRA equivalent covers are summarized in Table 3.
2. The RCRA Subtitle C- and D-equivalent covers (Figure 3) were visually inspected during the First Quarter (December 2006) for signs of erosion, settlement, vegetative growth, and cracks and fractures in asphalt/concrete surface areas by the OM&M Supervising Contractor. The condition of the slope along the northwest perimeter of Area 2 close to VW-46, BW-24 and BW-25 (see Figure 3) was also inspected for signs of erosion and/or settlement (e.g., cracking, slippage, etc.) during this initial inspection. Copies of the RCRA Subtitle C-equivalent cover and Subtitle D-equivalent cover O&M Inspection Sheets are included in Appendix A.1. The following are the key observations from this initial inspection of the RCRA covers:
 - Erosion: Significant erosion was not observed on the cover areas or on the northwest slope.
 - Settling: Noticeable settling was not observed on the cover areas or on the northwest slope.
 - Cracks: Significant cracks were not observed on the cover areas or on the northwest slope.
 - Vegetation Growth: Vegetation on the covers consisted of mostly dormant grasses and some weeds due to minimal rainfall in the months prior to the inspection.
 - Weed Control: Some weeds were observed on the cover areas but growth was limited due to minimal rainfall. Weed growth is under control by a landscape contractor.
 - Animal Burrows: Animal burrows were not observed on the cover areas or the northwest slope.
 - Vectors: Vectors (mice, rats, or mosquitoes) were not observed on the cover areas.
 - Anchor Trench: Noticeable settlement was not observed. The cleanouts for the French Drain collection piping were observed to be clear. At the time of inspection, water was not being discharged from the French Drain dewatering pipe.
 - Road Condition: Noticeable settlement, ruts, or potholes were not observed. The road is surfaced with aggregate base material and is in good condition.
 - Other: Other issues or conditions of concern were not noted.

3. Problems relating to the RCRA equivalent covers were not observed during the initial inspection and follow-up maintenance activities were not necessary.
4. During the next reporting period, a formal inspection of the RCRA covers will be performed by an independent engineer per the requirements of Title 22, Section 66264.228(k), (p) and (r). However, throughout the reporting period, the independent engineer conducted informal inspections of the Site resulting in no significant observations. Also, the O&M activities for the RCRA Subtitle C-equivalent cover will be performed to meet the requirements of Title 22, Section 66264.310. The RCRA Subtitle C- and D- equivalent cover O&M activities will include conducting an annual survey by a California-State licensed land surveyor to determine the horizontal location and elevation (i.e., settlement) of the settlement monuments. The survey will locate the settlement monuments according to the state-plane coordinate system and elevation pursuant to the North American Vertical Datum (NAVD, 1988) system. Local benchmarks used throughout the project history will be used for survey control points. The survey will have an accuracy of ± 0.01 foot.
5. The surface drainage control system at the Site was sized to accommodate the 100-year, 24-hour storm. The final surface grades were designed to average 2 to 3 percent to allow long-term drainage, radially away from the center of the Site. In the next reporting period, the surface grades will be examined during the annual RCRA cover survey at the Site. Deviations from as-built grade will be visually observed and maintenance conducted, as necessary to mitigate potential for ponding.
6. A single lane access road provided on the Site allows access from Greenleaf Avenue to the reservoir gas collection system. A turnaround is provided at the reservoir gas collection system. The access road cross-section consists of a 10-foot-wide, 6-inch-thick, crushed aggregate base course that is integrated within the top cover of RCRA Subtitle C-equivalent and Subtitle D-equivalent cover areas. As noted in Item 2 above, the access road was inspected during the initial inspection of RCRA covers. Based on the initial inspection, repairs to the access road were not necessary. Further evaluation of the access road grading will be performed during the annual survey of the RCRA covers and identified problems will be reported according to the OM&M Plan. The concrete paved ramp on the west side of the RCRA cover areas for access onto Parcels 26 was also inspected. The paved access ramp was found to be in good condition.

3.2 SOIL GAS MIGRATION CONTROL SYSTEM

1. The soil gas migration control system includes:

- Reservoir Gas Collection System
- Building Modifications
- Sentinel Biovent System

Manufacturer manuals for O&M of equipment along with maintenance schedules related to these systems are provided in the OMMP (TRC, 2006a). Start-up/Shut down procedures for the soil gas migration control system can be found in the Soil Gas Collection, Venting and Treatment System Startup Protocol (TRC, 2005b).

2. The performance requirements and frequency of O&M activities for the soil gas migration control system are summarized in Table 3.

3.2.1 RESERVOIR GAS COLLECTION SYSTEM

1. The Reservoir Gas Collection System consists of a gas collection geocomposite layer incorporated in the RCRA C-equivalent cap, perforated collection piping in gravel filled trenches under the RCRA C-equivalent cap, and the gas treatment system. The gas treatment system consists of a blower, granular activated carbon canisters for removal of organic vapors, vent stack, and an electrical control system. The gas treatment system also includes an autodialer that will contact the designee of the O&M Supervising Contractor in case of system shutdown. If the auto dialer is activated by the system, a technician will be called to the Site to observe conditions, perform any necessary repairs and/or restart the system.
2. The Reservoir Gas Collection System can be operated in either an active or passive mode. The system was operated in an active mode (i.e., under suction provided by the blower in the gas treatment system) during this reporting period. After the first year (end of the next reporting period), the performance data will be reviewed to determine if a change to the passive mode (i.e., system no longer under vacuum using blower; only venting to atmosphere) is appropriate. The “trigger” for switching to the passive mode is based on the methane collection rate being below 2.3 lbs/day.
3. Monthly O&M inspections were performed for the Reservoir Gas Collection System during this report period. The O&M Inspection Sheets for the Reservoir Gas Collection System are included in Appendix A.2.

The following are the key observations and comments from the monthly inspections of the Reservoir Gas Collection System:

- Gate, Lock and Fence: The gate, lock, and fence were found to be in good condition during this reporting period.
 - Electrical Meter and Controls: The electric meter and controls were found to be in good condition and operational during this reporting period.
 - Auto-Dialer: The auto dialer was found to be in good condition and operational during this reporting period.
 - Equipment (Vent Stack, Knockout Pot, Blower, Carbon Canisters, Hoses, Fittings, Piping, Instruments, Etc.): All equipment was found to be in good condition and operational during this reporting period with the exception of a possible problem with the pitot tube flow measurement device on the discharge of the blower. The measurement readings had changed and were indicating incorrect flow rates. The pitot tube has been replaced and the readings have returned to normal.
4. Problems relating to the Reservoir Gas Collection System O&M activities were not observed during the inspections and follow-up maintenance activities were not necessary with the exception of the pitot tube replacement noted above.
 5. Based on the vapor inlet and outlet sample results from the carbon canisters, it was determined that a carbon replacement was appropriate. In preparation for the replacement, samples of the spent carbon in the canisters were collected during this reporting period and analyzed for profiling by the carbon vendor. Based on the results, the carbon was classified as non-hazardous. The spent carbon was removed and replaced with new granular activated carbon on June 5, 2007. The spent carbon was transported offsite for regeneration. The non-hazardous waste manifest will be included in the Annual Report.
 6. If the system is switched to the passive mode after 12 months, the O&M inspections will be performed semi-annually. Otherwise, O&M for the system will continue to be performed monthly until the system is switched to the passive mode.

3.2.2 BUILDING MODIFICATIONS

1. The O&M for the Building Modifications involve review of in-business air monitoring results. If site-related constituents are detected from in-business air monitoring above Indoor Air Threshold Levels (Table 2), the affected parcel(s) will be inspected more frequently than the annual inspection frequency. Changes in inspection frequency will be based on the Decision Matrix for In-Business and Ambient Air Monitoring (see Section 4.1.2). The parcel inspections will involve inspecting building foundations and locations where filling or re-sealing of cracks have been performed, in addition to other areas covered with RCRA Subtitle D-equivalent covers.
2. Based on the in-business air monitoring results noted in Section 5.1.2 for this reporting period, the parcel inspection will remain annual. During this reporting period, eighteen of the twenty one parcels were inspected. The inspection for the remaining three parcels will be performed during the next reporting period. The O&M Parcel Inspection Sheets are included in Appendix A.3. The following are the key observations and comments from the inspections of the parcels:
 - Cracks: Minor hairline cracks were observed in the crack sealing material in the engineered concrete areas in Parcels 21 and 41. The hairline fractures appeared to be “surface” cracks and do not penetrate through the sealant.
 - Damage/Penetrations: Damaged areas and/or penetrations were not observed in the specified parcel areas.
 - Erosion: Significant erosion was not observed on the parcels.
 - Photoionization Detector (PID) Survey: A maximum reading of ~16 ppmv was detected in Parcel 21 inside the building above the engineered concrete.
 - Other: Other issues or conditions of concern were not noted.
3. Other than the minor surface hairline fractures noted in the crack sealing material in the engineered concrete areas in Parcels 21 and 41, problems relating to the parcels were not observed during the inspections and follow-up maintenance activities were not necessary.
4. The hairline fractures will be inspected during the next inspection period.

3.2.3 SENTINEL BIOVENT SYSTEM

1. The Sentinel Biovent System consists of 24 passive biovent wells at the perimeter of areas where waste is located as shown in Figure 3. A semi-annual inspection was performed for

each well during this reporting period to verify the integrity of well head components. The O&M Inspection Sheets for the Sentinel Biovent Wells are included in Appendix A.4. The following are the key observations and comments from the semi-annual inspections of the Sentinel Biovent Wells:

- Wellhead (Vented Steel Enclosure, Lock, Concrete Base, Baroball Valve): The wellhead components were found to be in good condition and operational at the time of inspection.
 - Well Casing: The casings were found to be in good condition and operational at the time of the inspection.
 - Erosion Around Wellhead: Significant erosion around the wellheads was not observed at the time of inspection.
2. Problems relating to the Sentinel Biovent Wells were not observed during the inspection and follow-up maintenance activities were not necessary.

3.3 GROUND WATER AND SOIL VAPOR WELLS

1. The performance requirements and frequency of O&M activities for ground water and soil vapor monitoring wells are summarized in Table 3.
2. The ground water and soil vapor monitoring wells were inspected during each monitoring event (first and second quarters) for well head integrity and surrounding area conditions (i.e., heavy vegetation, construction debris, equipment storage, etc.). The locations of the wells are shown in Figures 3 and 4. The O&M Inspection Sheets for the Ground Water Monitoring Wells and Soil Vapor Monitoring Wells are included in Appendices A.5 and A.6. The following are the key observations and comments for this period regarding inspections of the wells:
 - Wellhead (Well Box, Cover, Gasket and Concrete): The well box and concrete pad for VW-25 was replaced during this monitoring period due to cracking in the concrete pad and the well box being displaced from the pad. The wellhead components of the remaining wells were found to be in good condition and operational at the time of inspection.
 - Well Lock and Casing Cap/Plug: The locks, casings and cap/plugs were found to be in good condition and operational at the time of the inspection.
 - Erosion Around Wellhead: Significant erosion around the wellheads was not observed at the time of inspection.

3. Problems relating to the ground water and soil vapor wells were not observed during the inspections and follow-up maintenance activities were not necessary with the exception of the wellhead box and concrete replacement on Vapor Well VW-25.

3.4 STORMWATER DRAINAGE SYSTEM

1. The performance requirements and frequency of O&M activities for the stormwater drainage system are summarized in Table 3.
2. The stormwater drainage system consists of berms, swales, ditches, cleanouts, drain pipe from the french drain of RCRA Subtitle C-equivalent cap and a precast concrete catch basin near the northeast corner of the Site. Figure 6 shows the major drainage systems at the Site. The stormwater drainage system was inspected for excessive vegetation, sedimentation and debris in the channels and around the drains and catch basin inlet, and for soil erosion.
3. Control of stormwater runoff is provided by the stormwater drainage system. Stormwater runoff at the Site is also conveyed through sheet flow and concentrated areas of surface flow. Berms (either soil, sandbags, asphalt, or concrete) concentrate the sheet and surface flows and direct it towards historical stormwater discharge points along the perimeter of the RCRA covers and onto the perimeter parcels or into storm drains. Natural and planted vegetation is used at the Site to reduce surface erosion and help control surface water flow. During the establishment of cover vegetation in this reporting period, Best Management Practices (BMPs) were implemented to minimize silt and debris from leaving the Site. BMPs include the installation of straw wattles, hay bales, sand bags, silt fencing, detention basins and/or a combination of these sediment control measures prior to the beginning of the wet season and during/after significant storm events if necessary. BMPs were installed at the perimeter fence on the southeast side of the Site (Parcels 26, 49, and 51). The BMPs are still in place at the Site.
4. The implemented BMPs were examined during the inspection of the stormwater drainage system. The stormwater drainage system was inspected one time at the beginning of this monitoring period (January 2007) and will be inspected again at least once within the next six months and prior to the beginning of the wet season (typically beginning in October). Unscheduled inspections of the stormwater drainage system were not performed since significant storm events with accumulated precipitation greater than 2 inches over a 24-hour period did not occur during this monitoring period.

5. For the inspection of the Stormwater Drainage System (berms, swales, ditches, cleanouts, drain pipe from French Drain of RCRA Subtitle C-equivalent cap and precast concrete catch basin near the northeast corner of the Site), an O&M Inspection Sheet was completed. The O&M Inspection Sheet for the Stormwater Drainage System is included in Appendix A.7. The following are the key observations and comments from the inspection of the system:
 - Catch Basin (near northeast corner): A minor amount of sediment was observed in the catch basin. The sediment did not require removal.
 - Drain Pipe from French Drain: A small amount of water was draining from the pipe during the inspection; the pipe did not appear to be blocked.
 - Cleanouts for French Drain: The cleanouts were opened and found to be clear of liquid and/or foreign material. Also, the ring and cover of each cleanout was in good condition.
 - Sediment Buildup: Significant sediment buildup was not observed in the drainage system.
 - Vegetation Growth: Vegetation growth was minimal in the drainage system components due to lack of rainfall.
 - Erosion: Significant erosion was not observed.
 - Settlement: Noticeable settlement was not observed near the stormwater drainage features.
 - Cracks: Significant cracks were not observed in the stormwater drainage features.
 - Other: Some minor sediment accumulation occurred at Parcel 26 in a detention basin located at the gate of the driveway to Parcels 29 and 30. The sediment did not require removal.
6. Problems relating to the Stormwater Drainage System were not observed during the inspection and follow-up maintenance and/or repair activities were not necessary.

3.5 LEACHATE MONITORING/CONTROL SYSTEM

1. The performance requirements and frequencies of O&M activities for the leachate monitoring/control system are summarized in Table 3.
2. The leachate monitoring/control system consists of four Leachate Collection (LC) Wells. The locations of LC Wells are shown in Figure 3. The O&M of the four LC Wells consisted of inspections, monitoring and recovery of leachate that accumulated in the wells. During this reporting period, the inspections were performed twice each week.

3. Based on the LC Well monitoring and bailing results discussed in the Final Compliance Testing Report (TRC, 2006c), a management strategy was developed to reduce and maintain the leachate levels in the LC Wells at or below 12 inches above the bottom of the well. The strategy is intended to maintain liquid levels in the LC Wells throughout the OM&M period in accordance with the ARARs and performance criteria. Specifically, if the liquid level in an LC Well reaches 12 inches or more, the liquid was removed from the well and stored onsite pending transportation/disposal to an approved facility.
4. During this reporting period, the liquids management strategy consisted of monitoring and bailing (if necessary) twice each week based on the measured liquid level in each well. In general, the strategy for determining whether to bail consisted of the following:
 - **Liquid Level <12 inches prior to liquids removal:** Monitor Liquid Level Monthly. Bail liquids to below 12 inches if the liquid level is >12 inches and increase monitoring frequency if the liquid level remains above 12 inches for 2 consecutive monthly monitoring periods.
 - **Liquids Level 12 to 36 inches prior to liquids removal:** Twice weekly monitoring and bailing to below 12 inches
 - **Liquid Level 36 to 72 inches prior to liquids removal:** Twice weekly monitoring and bailing to below 12 inches.
 - **Liquid level >72 inches:** Limited duration pumping. A recharge test will be conducted prior to discontinuing pumping.
5. During this reporting period LC-1, LC-2 and LC-4 were monitored and bailed twice weekly. LC-3 was monitored once per week and bailed if necessary. The liquid levels in LC-2 and LC-4 exceed 72 inches prior to liquids removal each week and a temporary pumping system for each well has been designed and will be installed during the next reporting period.
6. Reporting on LC Wells monitoring and bailing occurred both as part of progress calls and in reports submitted every two weeks to the WDIG Coordinator. A summary of the monitoring and bailing results is presented in Section 5.2. The O&M Inspection Sheets for the Leachate Monitoring/Control System are included in Appendix A.8. The following are the key observations and comments regarding the wells during this monitoring period:
 - Wellhead (Well Box, Cover, Gasket and Concrete): With the exception of some well box gaskets, the wellhead components were found to be in good condition at the time of inspection. The worn well box gaskets were replaced as necessary during the reporting period.

- Well Lock and Casing Cap/Plug: The locks, casings and cap/plugs were found to be in good condition at the time of the inspection.
 - Liquid Present in Well Box: Liquids present inside of well boxes from bailing activities were removed during O&M visits as necessary. Also, greater care was taken to minimize releases of liquids both inside and outside of the well boxes during bailing activities.
 - Erosion Around Wellhead: Significant erosion was not observed during the reporting period.
7. Problems relating to the Leachate Monitoring/Control System O&M were not observed during the inspections and follow-up maintenance activities were not necessary other than the following minor items. Well boxes were cleaned periodically to remove liquids accumulated during bailing activities and some gaskets were replaced as necessary.

3.6 SITE SECURITY

1. The performance requirements and frequencies of O&M activities for the Site security features are summarized in Table 3.
2. Inspection of the perimeter fencing, gates, and other Site security features were conducted twice during this reporting period. Partial inspections were also performed during each visit by O&M Supervising Contractor personnel and reported on daily field sheets. These inspections included checks for vandalism or other damage to Site security features such as fencing, gates, and locks. The integrity of the fence was checked to insure that the fencing was secure (e.g., no holes or breaks) and gates were working properly and locks were in place.
3. A 20-foot-high "stray ball" fence is constructed along the top of the north slope at the boundary with St. Paul High School. This is the area where stray balls may land during field play at the athletic field of the high school. The stray ball fence is not meant to be part of the Site security measures and controls, but is intended to reduce the potential for stray balls to be lost and/or control unauthorized access onto the Site. A man-gate is provided between the perimeter security fence and the High School athletic field. The stray ball fence was inspected for damage, such as rips/tears in the fabric or loose steel cables/hardware, during the Site security inspection.

4. The O&M Inspection Sheets and Daily Field Reports for the Site Security features are included in Appendix A.9. The following are the key observations and comments for this period regarding the security features:
 - Security Fencing: The security fencing was observed to be in good condition. Small damaged areas were noted and repaired.
 - Erosion/Undermining: Significant erosion or undermining was not observed during the inspections.
 - Access Gates and Locks: Access gates were in good condition and locks were in place during the inspections.
 - Warning Signs: Warning signs were in place along the perimeter fence during the inspections.
 - Stray-Ball Fence: The stray ball fence was found to be in good condition during the inspections.
 - Other: Other security issues or conditions of concern were not noted.
5. Problems relating to the security features were not observed during the inspections and follow-up maintenance activities were not necessary with the exception of the following:
 - Minor repairs to damaged fencing.
 - Removal/painting over graffiti.

3.7 LANDSCAPE AND VEGETATION MAINTENANCE

1. The performance requirements and frequencies of O&M activities for the landscape and vegetation maintenance are summarized in Table 3.
2. The purpose of landscape maintenance is to maintain the overall aesthetic quality of the Site. Maintenance of the landscaping included irrigation of the trees and shrubs near the high school to the northeast of the Site, and periodic Site maintenance work such as mowing the capped areas and pruning trees and shrubs, and removal of unwanted weeds. Irrigation of the landscape vegetation near the school continued during this reporting period and will continue until the planted shrubs become established and can live without further irrigation. The frequency and duration of watering was implemented according to the recommendations of the subcontractor that performs the landscaping work.

3. The following table summarizes the landscape and vegetation maintenance tasks, performance standards and activities performed during this reporting period.

**Landscape/Vegetation
Performance Standards, Tasks and Activities**

Task	Performance Standards	Activities This Period
Vegetative Cover Mowing	Maintain neat appearance, allow easy access to monitoring wells	Mowing activities did not occur during this reporting period due to limited rainfall and minimal vegetation growth.
Vegetative Cover Replacement	70 percent vegetation coverage	The condition of the shrubs and planted vegetation is good.
Tree Pruning	Promote healthy growth of site trees, prevent damage to stray ball fence, plant off-site encroachment	Tree pruning was not required during this monitoring period.
Landscape Area Weed Control	Maintain healthy appearance of trees, bushes and ground cover	Weed removal is under control by routine landscaper maintenance. Ground cover (honeysuckle) is growing very well. Additional weed removal activities were performed prior to St. Paul High School events.
Site Housekeeping	Removal of debris, trash or wastes from the Site.	Site housekeeping was observed to be in good condition.

4. Based on informal qualitative acceptance criteria for vegetation/ground-cover growth employed by California State Agencies, counties and cities, a 70 percent vegetation coverage over the RCRA Subtitle C- and D-equivalent covers is considered acceptable for the Site. A vegetation inspection was performed during compliance testing in 2006 to evaluate vegetation growth. Based on the inspection, it appears that the total area of the RCRA covers remains just below the 70 percent vegetation threshold level. This is primarily due to the below normal rainfalls that have occurred over the past two seasons, with this past season being one of/if not the lowest in recorded history. A determination of the need to re-establish vegetation in areas that are substandard will be made after more average rainfall seasons have occurred. If the re-establishment of vegetation is determined

necessary, it will be scheduled to occur at the appropriate time of the year to support re-growth (e.g., re-seeding will occur early in the rainy season).

5. As part of O&M activities, landscape maintenance inspections are performed every two months. The O&M Inspection Sheets for the Landscape and Vegetation Maintenance are included in Appendix A.10. The following are the key observations and comments from the landscape inspections:
 - Condition of Shrubs and Planted Vegetation: Shrubs and planted vegetation were found to be in good condition during the inspections. Ground cover (honeysuckle) is growing very well.
 - Irrigation System Operation: The irrigation system was in good condition and operating properly.
 - Weed Growth: Weed removal is under control by routine landscape maintenance.
 - Erosion Around Planted Vegetation: Significant erosion around planted vegetation was not observed.
 - Vectors: Vectors (mice, rats, or mosquitoes) were not observed in the landscape areas.
 - Site Housekeeping: Site housekeeping was observed to be in good condition.
 - Other: Other landscaping issues or conditions of concern were not noted during this reporting period.
6. Problems relating to the Landscape Maintenance were not observed during the inspections and follow-up maintenance activities were not necessary. Additional landscape maintenance was conducted prior to St. Paul High School events.

3.8 PROBLEM IDENTIFICATION, CORRECTIVE ACTION, AND MAINTENANCE AND REPAIR ACTIVITY REPORTING

1. As noted in the OMMP (TRC, 2006a), if problems or conditions are identified that warrant action or attention, a Problem Identification and Corrective Action Report will be prepared and submitted to the WDIG Coordinator and EPA for approval. If the recommended corrective action is approved and the work performed, a Maintenance and Repair Activity Report will also be prepared and submitted to the WDIG Project Coordinator. These reporting requirements are for major maintenance and/or repairs to the remedial systems that have a material impact on the operation or performance of the remedial component and are not for minor maintenance and repair items.

2. Major maintenance and/or repair to the remedial systems did not occur during this reporting period and, therefore, Problem Identification and Corrective Action Reports were not submitted. Minor repairs were performed as noted in the O&M activities described in the prior sections of this report.

3.9 MANAGEMENT AND REPORTING

1. All O&M related records (i.e., Site O&M inspection sheets, Daily Field Reports, etc.) are being kept on file by the OM&M Supervising Contractor and have been included in this Semi-Annual OM&M Report.
2. An annual OM&M cost summary identifying costs incurred for OM&M activities, including any additional costs for repairs and maintenance will be prepared by the WDIG Project Coordinator at the end of the next reporting period. The cost summary will also include the WDIG Project Coordinator and WDIG project management and overhead costs.
3. In addition, the WDIG Project Coordinator will notify EPA of any non-compliance events (e.g., vapor well or in-business air emissions in excess of required limits) when they occur (e.g., each event).

3.10 REVISIONS TO THE O&M PLAN

1. The O&M Plan is an “evergreen” document that is subject to revision. Revisions may be proposed by the WDIG Project Coordinator for EPA review and approval. Alternatively, the EPA, subject to the governing decision documents for the Site (e.g., AROD, CD/SOW, Remedial Design and related deliverables), may direct WDIG to prepare revisions to the O&M Plan for EPA review and approval to address deficiencies or needed enhancements. Such revisions may include, but are not limited to, revisions in Standard Operating Procedures (SOPs), corrective actions, or instrumentation to address potential monitoring or safety concerns.
2. Based on the O&M activities performed and observations made during this reporting period, revisions to the O&M Plan are not proposed by the WDIG Project Coordinator:
3. The EPA did not request or direct the WDIG Project Coordinator to prepare revisions to the O&M Plan during this reporting period.

3.11 COMMUNICATION AND COORDINATION INTERACTIONS

1. This section describes the types of interactions that occurred with project stakeholders during the performance of the O&M activities in this reporting period. The key Site stakeholders are:
 - Regulatory Agencies (EPA and DTSC)
 - On-Site Owners and Tenants
 - St. Paul High School
 - Adjacent Residential Neighborhood
 - Adjacent Industrial/Commercial Neighbors
 - City of Santa Fe Springs
 - Land Developers/New Owners

2. The following is a summary of the key interactions between the OM&M Supervising Contractor and/or the WDIG Project Coordinator and the key stakeholders during this reporting period:
 - OM&M Supervising Contractor notification/coordination of on-site owners and tenants regarding planned first and second quarter OM&M events.
 - St. Paul High School contacts with OM&M Supervising Contractor regarding schedule of events, landscape and site appearance.
 - WDIG Project Coordinator contacts with potential land developers/new owners and the City of Santa Fe Springs regarding site conditions and issues.
 - WDIG Project Coordinator notification of Regulatory Agencies regarding planned first and second quarter OM&M events and other site related activities and issues.
 - WDIG Project Coordinator notification/coordination with owners/tenants regarding Institutional Controls Monitoring and Enforcement Work Plan (ICMEWP) checklist inspections.

4.0 SUMMARY OF MONITORING AND SAMPLING ACTIVITIES

4.1 GAS MIGRATION CONTROL SYSTEM

4.1.1 RESERVOIR GAS COLLECTION SYSTEM

1. Monitoring and sampling of the Reservoir Gas Collection System at the WDI Site was performed as part of the overall semi-annual monitoring program. The location of the Reservoir Gas Collection System is shown in Figures 3 and 4. Vapor samples were collected monthly during this monitoring period from the carbon vessel inlet (Reservoir Gas Collection System blower outlet) and carbon vessel outlet ports according to the procedures outlined in the Sampling and Analysis Plan (SAP), the SOPs in the Quality Assurance Project Plan (QAPP), and as described below.
2. During monthly monitoring and sampling of the Reservoir Gas Collection System, air samples were collected in Summa canisters (one each at the carbon vessel inlet and outlet). All samples were transported under Chain-of-Custody to a State of California certified laboratory (Columbia Analytical Laboratories) and analyzed for VOCs, methane, Total Gaseous Non-methane Organics (TGNMO) and fixed gases (i.e., nitrogen, oxygen plus argon, carbon dioxide, carbon monoxide and hydrogen) at the end of each round of monitoring.

4.1.1.1 Sample Collection Procedures

1. The following equipment and materials were used during each round of the Reservoir Gas Collection System monitoring:
 - Foxboro TVA-1000 Combination PID/flame ionization detector (FID) and a LANTEC GA 90 Landfill Gas Meter. Serial Numbers for instruments used during monitoring are shown on the Instrument Calibration Checklist sheets included in Appendix A.2;
 - Two six-liter stainless steel Summa canisters per round of sampling. Laboratory Quality Control Certification Sheets are included in Appendix A.11;
 - Two flow regulators per round of sampling, set by the laboratory to collect a 30-minute sample (i.e., average flow rate of approximately 200 milliliters per minute);
 - Pressure/vacuum gauge;
 - Krestal handheld combination thermometer, barometer, anemometer;
 - Reservoir Gas Collection System Air Monitoring Data Sheet;

- Daily Field Report;
 - Personal protective equipment (PPE) as described in the Final Health and Safety Plan (HASP).
2. The Reservoir Gas Collection System enclosure was visually inspected prior to collection of vapor samples to verify that there were no stored chemicals, cleaners or other fugitive sources of methane or VOC's. No unusual odors or fugitive emission sources were noted during the monthly Reservoir Gas Collection System monitoring.
 3. Flow-regulated, six-liter, stainless steel Summa canisters were used to collect air samples during monthly monitoring and sampling. The initial vacuum level was measured in each canister prior to start of sample collection and recorded on the Reservoir Gas Collection System Data Sheet. The flow regulators were then connected to the Summa canisters. Copies of the completed Reservoir Gas Collection Data Sheets for each sampling event are included in Appendix A.2.
 4. VOC monitoring from the Reservoir Gas Collection System carbon vessel inlet and outlet sample ports was also performed using the Foxboro TVA-1000 PID/FID. Methane, carbon dioxide and oxygen levels were measured from the sample ports using the LANTEC GA-90. Each instrument was allowed to warm up and was then calibrated using the calibration methods described in the instrument's operating manual. Copies of the instrument calibration records are included in Appendix A.2.
 5. VOC, methane, oxygen and carbon dioxide levels were measured by connecting the calibrated field instruments directly to the inlet and outlet sample ports using clean plastic tubing. The readings were recorded on the Reservoir Gas Collection Data Sheet. Clean plastic tubing was also used to connect the flow-regulated Summa canisters to the Reservoir Gas Collection System carbon vessel inlet port and outlet ports. Ambient temperature readings in units of degrees Fahrenheit and barometric pressure readings in units of inches of mercury were measured using a Krestal handheld combination barometer, thermometer and anemometer and recorded on the Reservoir Gas Collection Data Sheet.
 6. After recording the ambient conditions, the Summa canister valves were opened. The sampling start time was recorded on the Reservoir Gas Collection Data Sheet. The carbon vessel inlet and outlet vapor samples were collected over a continuous 30-minute period using the flow regulators. The sampling technician remained at the Reservoir Gas

Collection System site during the sample collection period to ensure the security of the Summa canisters.

7. At the completion of the vapor sample collection period, the Summa canister valves were closed, tubing disconnected and the flow regulators removed. A pressure gauge was attached to each Summa canister and the final vacuum level in the Summa canister was measured and recorded. The blower discharge pressure and temperature and ambient pressure and temperature were recorded. Final field instrument readings (i.e., methane, oxygen, carbon dioxide and VOCs) were measured from the carbon vessel inlet and outlet ports and the results recorded on the Reservoir Gas Collection Data Sheet.
8. A label was attached to each Summa canister using the following identification convention:
 - "WDI" (for Waste Disposal, Inc.);
 - An alphabetic code describing the Reservoir Gas Collection System Monitoring location;
 - An additional identifier corresponding to the sampling round being performed.

The sample identifier is illustrated below:

WDI-GTS-IN-4-23-07 (Reservoir Gas Collection System Carbon Vessel Inlet, Monthly Sample Collected on April 23, 2007.)

9. Each Summa canister was logged on a Chain-of-Custody form and placed in a cardboard container. The cardboard container was sealed with tamper proof tape and transported to Columbia Analytical Laboratories for analysis.
10. The Reservoir Gas Collection System monitoring and QA/QC results are presented in Chapters 5.0 and 6.0, respectively, and Conclusions and Recommendations are presented in Chapter 8.0.

4.1.2 BUILDING MODIFICATIONS

1. In-business air monitoring in 10 commercial buildings surrounding the WDI Site was performed quarterly during this monitoring period. The locations of the 10 businesses where samples were collected are shown in Figure 4. Air samples were collected from each of the in-business monitoring locations according to the procedures outlined in the SAP, the

SOPs in the QAPP and as described below. The frequency of monitoring is based on the Decision Matrix for In-Business and Ambient Air Monitoring shown in Figure 7. The monitoring frequency will be reviewed after the first year of OM&M monitoring and may be revised.

2. The First Quarter in-business air monitoring and sampling event occurred in December 2006, and the Second Quarter in-business air monitoring and sampling event occurred in March 2007. Indoor business air samples were taken at the following 10 locations:

- 12635 E. Los Nietos Road (IBM-03);
- 12811 E. Los Nietos Road (IBM-41);
- 9843 S. Greenleaf Avenue (IBM-50);
- 12633 Los Nietos Road (IBM-03B);
- 12637A Los Nietos Road (IBM-24B);
- 12083 Los Nietos Road (IBM-37);
- 9620 Santa Fe Springs Road (IBM-21);
- 9630 Santa Fe Springs Road (IBM-22);
- 9640 Santa Fe Springs Road (IBM-28); and
- 1274 Los Nietos Road (IBM-32).

Ambient air samples were also collected at the following two locations:

- Outside building at 12637 Los Nietos Road (IBM-24AMB);
- Outside at southeast corner of Los Nietos Road and Greenleaf Avenue (IBM-49AMB).

3. During the First Quarter monitoring event, 14 air samples, including two duplicate samples, were collected in Summa canisters. During the Second Quarter monitoring event, 15 air samples, including three duplicate samples, were collected in Summa canisters. All samples were transported under Chain-of-Custody to a State of California certified laboratory (Columbia Analytical Laboratories) and analyzed for VOCs by EPA Method TO-15 (including SIM analysis for vinyl chloride and 1,2-dibromoethane), methane and TGNMO by EPA Method 25C, and fixed gases by EPA Method 3C. During the Second Quarter monitoring event, it was determined that analysis of fixed gases on in-business air and ambient air samples was not necessary, and, as a result, analysis of fixed gases was not conducted on samples IBM-03B or IBM-24AMB. Future analysis of in-business air and ambient air samples will not include fixed gases.

4.1.2.1 In-Business Sample Collection Procedures

1. The following equipment and materials were used during each round of in-business and ambient air monitoring:
 - Foxboro TVA-1000 PID/FID, Serial Numbers for instruments used during monitoring are shown on the Instrument Calibration Checklist sheets included in Appendix A.12;
 - Fourteen six-liter stainless steel Summa canisters for First Quarter sampling and 15 six-liter stainless steel Summa canisters for Second Quarter sampling. Laboratory Quality Control Certification Sheets are included in Appendix A.11;
 - Flow Regulators for First and Second Quarter sampling, set by the laboratory to collect a 24-hour sample (i.e., average flow rate of approximately 4 milliliters per minute);
 - Stainless steel tee fitting with valve for duplicate sampling;
 - Vacuum pressure gauge;
 - Krestal handheld combination thermometer, barometer, anemometer;
 - Tamper proof tape;
 - In-Business Air and Ambient Air Monitoring Data Sheet;
 - Daily Field Report;
 - PPE as described in the HASP.
2. Coordination with tenants and/or owners occurred to schedule monitoring activities in each building. Prior to performing any monitoring and sample collection, personnel inspected each building to verify that it was unoccupied and that all doors and windows were closed. A suitable location inside of each target building, away from stored chemicals, cleaners or other sources of VOCs, was selected as the monitoring and sample collection point. The same locations were used for both monitoring events.
3. Flow-regulated, six-liter, stainless steel Summa canisters were used to collect air samples. The initial vacuum pressure was measured in each canister prior to start of sample collection and recorded on the In-Business and Ambient Air Monitoring Data Sheet (In-Business/Ambient Air Data Sheet). Copies of the completed In-Business/Ambient Air Data Sheets for the sampled locations are included in Appendix A.12.

4. For each sampling location, a summa canister was placed in the selected location inside the building and/or at the ambient air sampling location and ambient temperature and pressure were measured and recorded. Ambient VOC monitoring was also performed using the Foxboro TVA-1000 PID/FID. Prior to using the PID/FID, the instrument was allowed to warm up and was calibrated using the method described in the instrument operating manual. Copies of calibration records are included in Appendix A.12. Ambient temperature readings in units of degrees Fahrenheit and barometric pressure readings in units of inches of mercury were recorded using a Krestal handheld combination barometer, thermometer and anemometer.
5. After recording the ambient conditions (i.e., temperature, pressure, field VOCs), a flow regulator was connected to the Summa canister, the inlet valve was opened and the handle secured with tamper proof tape. The start time was recorded on the In-Business/Ambient Air Data Sheet. Air samples were collected over a continuous 24-hour period using the flow regulators.
6. Duplicate air samples were collected in Summa canisters as indicated in the QAPP. Duplicate sampling involved placing two flow-regulated Summa canisters next to each other at the sampling location, connecting them with the stainless steel tee fitting, opening the Summa canister valves and then opening the tee valve. During the First Quarter sampling, two duplicate samples were collected at locations IBM-37 and IBM-50. During the Second Quarter sampling, three duplicate samples were collected at locations IBM-41, IBM-49(AMB), and IBM-50.
7. At the end of the sampling period, the ambient temperature and pressure and field VOC measurements at the sample location were recorded. The tamper proof tape on the Summa canister valve was inspected, the condition noted and the tape was removed. The Summa canister valve was closed and the flow regulator was removed. A pressure gauge was connected to the Summa canister and the final vacuum level was measured and recorded. For the duplicate samples the same procedure was followed with the sampling tee being removed prior to the flow regulator being removed. The ambient conditions, tamper proof tape condition, sample collection stop time and the final Summa canister vacuum level were recorded on the In-Business/Ambient Air Data Sheet.

8. A label was attached to each Summa canister using the following identification convention:
 - "WDI" (for Waste Disposal, Inc.);
 - An alpha-numerical code describing the in-business monitoring location;
 - An additional identifier corresponding to the sampling round being performed.

The sample identifier is illustrated below:

WDI-IBM-50-12-10-06 (In-business monitoring of Parcel 50, sample collected on December 10, 2006).

9. Each Summa canister was logged on a chain-of-custody form and placed in a cardboard container. The cardboard container was sealed with tamper proof tape and transported to Columbia Analytical Laboratories for analysis.
10. The in-business and ambient air monitoring and QA/QC results are presented in Chapters 5.0 and 6.0, respectively, and Conclusions and Recommendations are presented in Chapter 8.0.

4.1.3 SENTINEL BIOVENT SYSTEM

1. As stated in the Compliance Testing Plan (TRC, 2005a), the Sentinel Biovent System is a secondary Gas Control System for the Site. There are no specific performance goals for the system. As such, the biovent wells do not have data quality objectives for compliance monitoring. Also, the wells are not constructed as monitoring systems and are not configured to be sampled. During this monitoring period, an inspection of the biovent wells was conducted. Results from the inspection are presented in Section 3.2.3 and the inspection sheets are included in Appendix A.4.

4.2 LEACHATE MONITORING/CONTROL SYSTEM

4.2.1 LEACHATE COLLECTION WELLS

1. Sounding and bailing of the Leachate Collection Wells at the WDI Site was conducted during this monitoring period. The location of the Leachate Collection wells, LC-1, LC-2, LC-3 and LC-4, is shown in Figure 3. Monitoring and bailing activities were performed (with some deviations) according to the procedures outlined in the SAP, the SOPs in the QAPP and as described below. Deviations from the SOPs are described below along with

the rationale for the changes. Routine monitoring and bailing events have been conducted twice weekly and have continued since the end of the Compliance Testing period and are reported herein for monitoring and bailing through May 2007.

4.2.2 SOUNDING AND BAILING PROCEDURES

1. The following equipment and materials were used during the Leachate Collection well sounding and bailing events:
 - Herron water interface meter;
 - 2-inch diameter, 36-inch long PVC Bailers;
 - Bailer Cord;
 - 55-gallon steel drums with lids;
 - PPE as described in the HASP;
 - Daily Field Report forms and/or appropriate monitoring data sheets;
 - Timepiece;
 - Pen with indelible ink.
2. Each well was sounded by first removing the well box cover and well cap. The interface meter was then lowered into the well until the buzzer on the sensor spool activated indicating that the sensor end had encountered liquid. The sounder cable was pulled up slightly and liquids that may have accumulated on the level sensor end as it moved down the well casing were shaken off. The sensor was lowered again to the liquid level. The sensor was raised and lowered several times into and out of the liquid to confirm an accurate reading of liquid level (± 0.01 foot). Once the liquid level had been established with the sounder, the reading on the interface meter tape at the top of the well casing was noted as the depth to liquid. The reading was recorded on the Leachate Collection Monitoring Data Sheet. The Leachate Collection Monitoring Data Sheets are included in Appendix A.8.
3. After measuring the depth to liquid, the interface meter sensor was lowered to the bottom of the well to sound total well depth. The sensor was lowered until it was felt to hit the bottom of the well (i.e., tension on the line was reduced). To assure that the sensor or cable were not caught inside the well and actually at the bottom, the cable was shaken and pulled up and lowered several times. When the sounder could not be lowered deeper into the well it was assumed to be at the bottom. The tape was pulled up until tension could just be felt and the reading on the interface meter tape at the top of the well casing was recorded as the total depth of the well on the Leachate Collection Monitoring Data Sheet.

4. As required by SOP in the QAPP, a well that contained more than 12 inches of liquid was bailed until the level was less than 12 inches. Liquids were removed from the wells by bailing using a 2-inch diameter by 36-inch long PVC bailer. The liquids from the four wells were collected in 55-gallon steel drums. Bailing time and initial and final liquid levels were recorded on the Leachate Collection Monitoring Data Sheet.
5. The bailed liquids were placed in 55-gallon drums. The frequency of sounding and bailing was two times per week. This frequency has been maintained since the end of the Compliance Testing period (except when adverse weather conditions prevented access to the Site). Bailing of the wells that contained more than 12 inches of liquid was performed during each monitoring event. The regular, twice-weekly bailing and sounding readings were recorded on Leachate Collection Monitoring Data Sheets.
6. The Leachate Collection Wells monitoring results are presented in Chapter 5.0, and Conclusions and Recommendations are presented in Chapter 8.0.

4.2.3 DEVIATIONS FROM THE SOP

1. SOPs in the QAPP, developed prior to remedy design, directed that all equipment should be decontaminated between well sounding and bailing. Decontamination of equipment between leachate well sounding and bailing was not performed because cross-contamination is not a concern and sampling is not performed. The liquids in the basin are known to be significantly impacted with petroleum hydrocarbons and the levels and distinction of contaminants between wells is not important.
2. SOPs in the QAPP, developed prior to remedy design, directed that liquids removed from the wells would be accumulated in a Baker tank. However, 55-gallon drums were used as an alternative means of storage.
3. SOPs in the QAPP, developed prior to remedy design, directed that liquids removed from the wells would be placed in the oil/water separator for treatment. Liquids removed from the wells were not treated in an oil/water separator. Collected liquids were profiled and will be transported to an approved facility during the next monitoring period.

4.3 SOIL GAS MONITORING

4.3.1 VAPOR MONITORING WELLS

1. Monitoring and sampling of the vapor monitoring wells at the WDI Site was conducted quarterly during this monitoring period. The locations of the vapor wells are shown in Figures 3 and 4. Soil gas samples were collected from the vapor well sample ports according to the procedures outlined in the SAP, the SOPs in the QAPP and as described below. The frequency of monitoring is based on the Decision Matrix Criteria for Soil Gas Monitoring Data shown in Figure 8. The monitoring frequency will be reviewed after the first year of OM&M monitoring and may be revised.
2. Vapor well monitoring and sampling was conducted in December 2006 (First Quarter) and March 2007 (Second Quarter) during this monitoring period. During the First Quarter event, three trip blanks and two ambient air samples (VW-42-Ambient and VW-62-Ambient) were collected (one ambient sample collected at the wellhead of a compliance well and one ambient sample collected at the wellhead of a non-compliance well). During the Second Quarter event, only two trip blanks were collected and no ambient air samples next to compliance and non-compliance wells were collected. This oversight will be corrected during the Third Quarter vapor well sampling event.
3. The vapor well locations shown in Figures 3 and 4 are nested wells with screened intervals at different depths (shallow, intermediate and/or deep). There are 22 vapor well locations shown in Figures 3 and 4. Two of these wells (VW-32 and VW-33) were not sampled because they were destroyed during construction or paved over. The exact locations of these wells could not be verified and the conditions of the wellheads are not known. These wells should not pose a concern given their location away from waste and above groundwater levels. The remaining 20 vapor well locations contain a total of 50 nested wells.
4. Vapor wells VW-29 through -39, -41, and -42 are located along the perimeter of the Site and are used to monitor migration of soil vapors offsite as well as towards nearby buildings. These vapor wells are designated "Compliance Vapor Wells" as indicated in Figure 4.
5. Vapor wells VW-25, -46, -49, -51, -55, -56, -58, -61, and -62 are located in or near historic areas of non-compliance. These wells were selected to monitor for occurrence and/or migration from these non-compliance areas and will not be used to determine compliance with Soil Gas Performance Standards; and therefore, are designated as "Non-Compliance Vapor Wells" as indicated in Figure 4.

6. During the vapor well monitoring, a vapor sample was collected in a Summa canister from each nested well installed in the vapor well location. All samples, including the confirmation samples, were transported under Chain-of-Custody to a State of California certified laboratory (Columbia Analytical Laboratories) and analyzed for VOCs by EPA Method TO-15, methane and TGNMO by EPA Method 25C, and fixed gases (i.e., nitrogen, oxygen plus argon, carbon dioxide, carbon monoxide and hydrogen) by EPA Method 3C. If TGNMO concentrations were significant, methane was analyzed by EPA Method 3C.

4.3.2 VAPOR WELL SAMPLE COLLECTION PROCEDURES

1. The following equipment and materials were used during the vapor well monitoring:
 - Foxboro TVA-1000 Combination PID/FID or equivalent;
 - LANDTEC GA-90 Landfill Gas Meter;
 - Dwyer 475 Mark III Handheld Digital Manometer with appropriate pressure ranges for the wells to be monitored;
 - Thomas vacuum pump (Model 107 COC 18-TFE);
 - Krestal handheld combination barometer, thermometer and anemometer;
 - Timepiece;
 - Pen with indelible ink;
 - 6-liter Summa canisters;
 - Flow regulators, set by the laboratory to collect a 30-minute sample (i.e., average flow rate of approximately 200 ml/min);
 - Thermometer inserted through a center drilled stainless steel tee;
 - Generator;
 - Vapor well monitoring data sheets;
 - Vacuum pressure gauge;
 - 1 to 10 liters per minute flow meter;
 - Various 1/4- and 1/2-inch-diameter Tygon® tubing lengths and wye-splitter fittings;
 - PPE as described in the HASP;
 - Soil Vapor Well Monitoring Data Sheet.
2. The area around the vapor wells was inspected prior to collection of samples to verify there were no stored chemicals, cleaners or other potential sources of VOCs. Also, the gas powered electrical generator powering the vacuum pump was kept down wind of the wells during sampling.
3. The initial pressure/vacuum and soil gas conditions in each of the nested well monitoring points were measured. Pressure/vacuum and soil gas readings were measured by attaching

the appropriate instrument to the well using a short piece of tubing. Pressure/vacuum readings were collected using a suitable range Dwyer 475 Mark III Handheld Digital Manometer. Vapor well VOC levels were measured using the Foxboro TVA-1000 PID/FID. Vapor well methane, carbon dioxide, and oxygen levels were measured using the LANDTEC GA-90. All readings were recorded on the Soil Vapor Well Monitoring Data Sheet. Both gas analysis instruments were allowed to warm up and were then calibrated using the calibration methods described in the instrument's operating manual. Copies of the instrument calibration records are included in Appendix A.6.

4. Each nested well monitoring point was purged prior to sample collection. Three well volumes of soil gas were withdrawn using the vacuum pump connected with tubing to the nested well monitoring point. The flow rate was measured using a 10-liter per minute capacity flow meter and the soil gas temperature was measured using a thermometer inserted through a center drilled stainless steel tee. The flow meter and thermometer were installed inline between the nested well monitoring point and the vacuum pump. The volume of air required to purge three well volumes was calculated as described in SOP S. The vacuum pump flow rate, soil gas temperature, purge time and volume were recorded on the Soil Vapor Well Monitoring Data Sheet. Copies of the completed Soil Vapor Well Monitoring Data Sheets for all sampled locations, including the confirmation sample locations, are included in Appendix A.6.
5. After well purging, VOC, methane, carbon dioxide and oxygen readings were measured again using the field instruments and the data recorded. After the post purge readings were collected, the field instruments were disconnected. Prior to connection of the Summa canister to the nested well, the initial vacuum pressure was measured in each canister. A 30-minute flow-regulator was then connected to each Summa canister and one flow-regulated Summa canister was attached to each nested well monitoring point to collect a soil gas sample. All data were recorded on the Soil Vapor Well Monitoring Data Sheet.
6. Ambient temperature readings in units of degrees Fahrenheit and barometric pressure readings in units of inches of mercury were measured using a Krestal handheld combination barometer, thermometer and anemometer and recorded on the Soil Vapor Well Monitoring Data Sheet.

7. After recording the ambient conditions, the Summa canister inlet valves were opened. The start time was recorded on the Soil Vapor Well Monitoring Data Sheet. Duplicate air samples were collected in Summa canisters as indicated in the QAPP. Duplicate samples were collected by connecting two flow-regulated canisters together using a "Y" manifold made from a Nalgene wye and Tygon tubing. After connecting the two canisters the third connection of the manifold was connected to the nested well monitoring point. Both canister valves were opened simultaneously to obtain a split sample. Air samples were collected over a continuous 30-minute period using the flow regulators. The technician remained at the vapor well during the 30-minute sample collection period to ensure the security of the Summa canisters.
8. Unusual odors or fugitive emission source were not noted during the vapor well monitoring events.
9. After the completion of the 30-minute monitoring period, the Summa canister valve was closed and the flow regulator was removed. A pressure gauge was attached and the final vacuum pressure in each Summa canister was measured. The sample collection stop times and the final vacuum pressures were recorded on the Soil Vapor Well Monitoring Data Sheet.
10. A label was attached to each Summa canister using the following identification convention:
 - "WDI" (for Waste Disposal, Inc.);
 - An alpha-numeric code describing the vapor well monitoring location and depth;
 - An additional identifier corresponding to the sampling round (date) being performed.

The sample identifier is illustrated below:

WDI-VW-55-I-3-14-07 (Vapor Well 55, intermediate monitoring point collected on March 14, 2007).
11. Each Summa canister was logged on a Chain-of-Custody form and placed in a cardboard container. The cardboard container was sealed with tamper proof tape and transported to Columbia Analytical Laboratories for analysis.
12. The vapor well air monitoring and QA/QC results are presented in Chapters 5.0 and 6.0, respectively, and Conclusions and Recommendations are presented in Chapter 8.0.

4.4 GROUND WATER MONITORING

4.4.1 GROUND WATER MONITORING WELLS

1. Monitoring and sampling of the ground water wells at the WDI Site was conducted once during this reporting period. The locations of the 12 ground water wells are shown in Figures 3 and 4. Ground water samples were collected from the wells according to the procedures outlined in the SAP, the SOPs in the QAPP and as described below. The frequency of monitoring is based on the Decision Matrix Criteria for Ground Water Monitoring shown in Figure 9. The monitoring frequency will be reviewed after the first year of OM&M monitoring and may be revised.
2. Ground water monitoring and sampling was conducted in December 2006 (First Quarter) during this monitoring period and will be conducted on a semi-annual basis during the first year of operation (First Quarter and Third Quarter). During the First Quarter event, 12 ground water samples along with three trip blanks, three field blanks, and three equipment rinseate blanks (one of each per day of sampling) and two duplicate samples (from GW-11 and GW-30) were collected.
3. The 12 ground water wells are divided into four groups; Background Wells, Point of Compliance (POC) Wells, Near-Source Detection Wells and Verification Wells. Background wells are onsite wells that have not been impacted by Site activities (typically they are located upgradient or cross-gradient on the Site). The selected background wells include GW-01, -02 and -32. In addition, well GW-11 was also monitored for deep background cross-gradient ground water quality.
4. POC wells are onsite monitoring wells located at the POC (i.e., downgradient edge of the waste unit). The selected POC wells include ground water wells GW-22, -23, and -26.
5. Near-Source Detection Wells are onsite detection wells located near the waste source area. Wells GW-10 and -33 are selected as near-source detection wells for long-term ground water monitoring.
6. The Verification Wells are onsite wells located near the property line of the Site downgradient of the Site waste source. The existing downgradient monitoring wells GW-27, -29, and -30 serve as verification wells for long-term ground water monitoring.

7. Ground water monitoring wells were sounded to determine liquid levels. The ground water samples were transported under Chain-of-Custody to a State of California certified laboratory (TestAmerica Analytical Laboratories) and analyzed for VOCs by EPA Method 8260B, chlorides and sulfates by EPA Method 300.0, total dissolved solids by EPA Method 160.1, pH by EPA Method SM4500-H,B, SVOCs by EPA Method 8270C and total dissolved metals by EPA Methods 6010 and 7470. Table 4A lists the COCs for which ground water is analyzed.

4.4.2 GROUND WATER MONITORING AND SAMPLE COLLECTION PROCEDURES

4.4.2.1 Ground Water Well Monitoring and Sample Collection Equipment

1. The following materials were used for this procedure:
 - Solinst water level meter with 200 feet of sounding line and a Type P.4 probe (or similar).
 - One 9-volt alkaline battery for power backup.
 - One-half-inch inside diameter vinyl tubing in 100-foot lengths.
 - Centrifugal, submersible, peristaltic pump or bailer for purging and sample collection.
 - pH and temperature meter.
 - Specific conductance meter.
 - Bailers.
 - Sample containers (provided by analytical laboratory, with appropriate preservatives as outlined in the QAPP).
 - Buckets and intermediate containers.
 - Coolers and ice.
 - Bailer cord.
 - Disposable (Nitrile) gloves.
 - Chemical-free paper towels.
 - Plastic sheets.
 - Sample bottle labels.
 - Daily Field Report forms and/or appropriate monitoring data sheets (see SOP J).
 - Ground Water Sampling Field Notes
 - Timepiece.
 - Pen with indelible ink.

4.4.2.2 Ground Water Well Sounding Procedures

1. Well sounding was conducted using a Solinst water level meter or similar device.
2. To sound the monitoring well, the cap on top of the well was removed, and the weighted end of the sounder was lowered into the well. The sounder was lowered until the buzzer on the sounder spool activated (“buzzed”), indicating liquids were at the sounder end. Depth to

water (DTW) was measured to the top of the casing at the surveyor's v-notch or otherwise marked location on the top of the casing. The DTW was noted on the monitoring data sheet. The probe was raised above the liquid level and resubmerged two or three times to confirm an accurate reading of liquid level.

3. To sound total well depth, the sounder was lowered until it was felt to hit the bottom of the well (tension on the line will reduce). To assure that the sounder was not "hung up" inside the well, the sounder cable was shaken and the sounder was further lowered, if possible. If it was not lowered further, the reading as "total depth" was recorded on the monitoring data sheet.
4. Field equipment was decontaminated between wells. Decontamination procedures are described in SOP G.

4.4.2.3 Ground Water Well Purging Procedures

1. Each well was purged prior to sample collection by withdrawing three well volumes of ground water. The volume of water present in each well was computed based on the length of the water column and the well casing diameter.
2. Water was purged from the bottom of the well screen interval. At the start of purging and after every well volume withdrawn, the temperature, conductivity, and pH (indicator parameters) of the purge water were measured. Samples were collected after the removal of three well volumes and when the value of indicator parameters did not vary by more than 10 percent over two consecutive measurements. As described in the QAPP and the SOP, these instruments were calibrated daily to maintain accuracy. Field parameter values were recorded on the Ground Water Monitoring Data Sheet, along with the corresponding purge volume. If the well was purged dry, samples were collected after the well returned to 80 percent of its original volume but not to exceed 2 hours.
3. A low flow sampling pump was used, in accordance with EPA guidance for ground water sampling of metals and general parameters.

4.4.2.4 Ground Water Well Sample Collection Procedures

1. Samples were collected using a clean, decontaminated Teflon®, stainless steel, or disposable bailer and a spool of new, clean polypropylene rope, or equivalent bailer cord. The bailer was fitted with a petcock valve or volatile organic analysis (VOA) tip to facilitate controlled filling of sample containers.
2. The bailer was lowered into the monitoring well and water samples were obtained from midpoint or lower within the water column; this was accomplished by lowering the bailer to the midpoint or lower before retrieving it from the well.
3. When removing the sample from the bailer to the sample bottle, the mixing of air was minimized by tilting the sample bottle and allowing the water to run down the inside wall of the bottle.
4. When sampling for VOCs, the 40-milliliter VOAs were completely filled with no remaining headspace. To avoid aeration, the VOA was held at an angle so that the stream of water flowed down the side.
5. The VOA was turned upside-down and tapped to check for air bubbles. If bubbles were present, the VOA was disposed of, and a new VOA filled.
6. Dissolved metal samples were field filtered by attaching a disposable, 0.45 micrometer filter to the discharge tubing upon the completion of well purging.
7. Plastic bottles without preservatives were completely filled to minimize air contact; however, 1-liter glass bottles were filled 90 percent full to allow room for expansion and contraction of liquid.
8. Each sample collected was identified as having originated from the site by prefacing each sample designation with "WDI" (for Waste Disposal, Inc.), identified by an alpha and numerical code for the well, and having an additional identifier corresponded to the ground water sampling round (date) being performed. The sample identifier is illustrated below:
 - **WDI-GMW-30-12-11-06** Existing Ground Water Monitoring Well No. 30, collected on December 11, 2006.

9. Information on analytical parameters, sample containers, methods of preservation, and holding times are specified in the QAPP.
10. Samples were packed in the following manner for shipment. Detailed transportation procedures are provided in SOP H.
 - Each sample container was wrapped in bubble pack or other packing material, placed in separate, sealable plastic bags, and then placed in an ice chest precooled to 4 degrees Celsius (°C) with Blue Ice® packages or double-bagged ice packets.
 - The completed Chain-of-Custody record going to the laboratory was placed in a sealable plastic bag, which was placed in the cooler.
 - The cooler lid was taped shut with strapping/packaging tape.
 - A custody seal was completed, signed and attached to the lid and the front of the cooler for hinged coolers. Two custody seals were attached to coolers with removable lids. One was attached to the front and one to the back of these coolers.
 - The coolers were hand-delivered or shipped via overnight carrier to the laboratory at the end of each day's sampling. Samples were shipped in a manner such that the laboratory received them within 24 hours or less from the actual sampling times, depending on the holding times.
11. The pumps used for purging and sampling of metals and general parameters were decontaminated after each use following procedures provided in SOP G.
12. Each sample container was labeled with the name of the person taking the sample, date and time, identification code, type of sample, preservation method, and analyses to be performed. The label also indicated if the sample was to be held in appropriate storage by the laboratory until the geologist/engineer determined if analyses was to be performed based on initial analytical results for representative samples.
13. Sample documentation was performed in accordance with the procedures in the SAP and SOP J and monitoring and measurement data was recorded on the appropriate monitoring data sheet. The data sheets are included in Appendix A.5.
14. Chain-of-Custody procedures which are provided in SOP I and discussed in the QAPP were used to maintain and document sample possessions. The Chain-of-Custody record was initiated at the time of sampling and contained the sample number, date and time, name and

dated signature of the person taking the sample, as well as the methods by which each sample was to be analyzed, and other pertinent information.

15. Sample transfers were noted on the record sheet for each sample. Standardized Chain-of-Custody forms were used for tracking samples from the point of origin in the field through laboratory processing and disposal.
16. The Chain-of-Custody forms accompanied the samples, enclosed within the ice chest. One copy of each form was retained by field personnel prior to shipment of the samples to the laboratory. Copies of the Chain-of-Custody records completed by the laboratory were returned with the results of laboratory analyses.
17. The ground water well monitoring and QA/QC results are presented in Chapters 5.0 and 6.0, respectively, and Conclusions and Recommendations are presented in Chapter 8.0.

4.5 STORMWATER MONITORING

1. The Long-Term Stormwater Monitoring Plan involves monitoring of stormwater runoff quality and volume and inspection and maintenance of the stormwater drainage system at the Site.
2. A SWPPP is not required since there are no known sources of potential surface pollutants to stormwater runoff from the Site area. Also, there have been no significant quantities of spills, leaks, treatments, or storage of known materials at the Site since the Site has been closed as a waste disposal facility in the mid to late 1960s. The fill soils comprising the RCRA-C equivalent and RCRA-D equivalent caps have been demonstrated to not be contaminated.

4.5.1 OBJECTIVES AND REQUIREMENTS

1. The objectives of the Long-Term Stormwater Monitoring Plan is to control and monitor stormwater runoff quality to determine effectiveness of the RCRA Subtitle C- and D-equivalent covers and implemented surface drainage control systems (i.e., stormwater management system), and potential degradation of stormwater quality due to tenant-related activities and/or migration of buried wastes.

2. There are no Long-Term Stormwater Monitoring Plan requirements or Performance Standards identified in the CD. The Long-Term Stormwater Monitoring Plan is designed based on the stormwater runoff quality monitoring requirements identified herein.

4.5.2 STORMWATER MONITORING PARAMETERS

1. The stormwater runoff quality monitoring parameters include the COCs identified for Long-Term Ground Water Monitoring Plan. The stormwater is monitored for ground water COCs in order to detect potential migration of contaminants from buried Site waste material. The stormwater COCs also include contaminants related to onsite activities (due to business conducted by the tenants of the onsite buildings). This provides information on possible contamination and environmental impacts caused by the tenant activities at the Site. The contaminants related to tenant onsite activities include oil and grease, metals, and total suspended solids (TSS). Table 4B lists the COCs for which stormwater is analyzed.
2. The stormwater runoff volume will also be monitored to verify the implemented surface drainage system meets the design requirements. The key design requirements identified for the Site surface drainage control system are as follows:
 - Prevent erosion of containment structure.
 - Design system for 100-year, 24-hour storm.
 - Integrate with existing offsite infrastructure.
 - Final grade to promote lateral drainage and prevent ponding due to future settlement.
 - Final grade to consider post-closure land use.

4.5.3 STORMWATER MONITORING PROGRAM

1. The proposed stormwater monitoring program includes monitoring of stormwater runoff quality and visual inspection of surface drainage control systems implemented at the Site (post construction).
2. The stormwater monitoring sampling locations, SW-1 through SW-6, are shown in Figure 5. The selected locations are the surface drainage catch basin (SW-2), which is located at the low spot of the Site to collect stormwater runoff and convey the collected water to the stormwater sewer system, and the locations within stormwater drainage paths (SW-3 through SW-6). Note that the sampling point SW-1 is not located within the catch basin area or drainage paths; instead the SW-1 location is the highest point (highest elevation) at the Site.

The analytical results of the sample collected at SW-1 will provide “background concentrations” of rainfall precipitation before it has significant Site surface contact and is conveyed to a runoff point. Stormwater samples will be collected and analyzed pursuant to the procedures and methods described in the QAPP and associated SOPs.

4.5.4 STORMWATER MONITORING FREQUENCY

1. The stormwater sampling and drainage system inspection will be conducted following the first significant storm event after construction of the Site remedies is completed and again after a second significant storm event. A significant storm event is one that has accumulated precipitation at the Site greater than 2 inches over a 24-hour period. Additional monitoring events may be performed as needed or at the direction of EPA.

4.5.5 STORMWATER MONITORING

1. Based on the stormwater monitoring requirements and frequency, sampling was not conducted during the reporting period due to minimal rainfall events and intensities. Routine inspections of monitoring points and control system features were conducted and are reported in Section 3.4 and Appendix A.7.

4.6 STATISTICAL ANALYSIS OF ANALYTICAL DATA

1. The statistical analysis of the soil gas and ground water analytical data is discussed below. The purpose of the statistical analysis is to compare the post remedy concentrations of soil gas and ground water COCs with concentrations that existed prior to remedy implementation. The constituent data that was measured prior to remedy implementation defines background concentrations for purposes of evaluating statistically significant changes/trends in chemistry post remedy. This approach is consistent with that discussed in EPA, 1989 in which a background concentration distribution is defined and used to evaluate trends/statistically significant changes in data after the background period.
2. As monitoring continues and the new data are found to be “in control”, i.e., within calculated limits, the background period and statistics of mean and variance will be updated to include the new data. The background update will occur every 2 years. This approach is consistent with that discussed in EPA, 1989 and Gibbons et al., 2003. If the data are found

to be “out of control,”(i.e., the data fall outside calculated limits), the background period will remain constant (i.e., include only data collected pre-remedy or that are “in control”).

3. Statistical analysis of the data is performed using the computer program DUMPStat developed by Discerning Systems, Inc. (Gibbons et al., 2003). Specifically, the Shewart-CUSUM control chart method for intra-well comparisons is used to derive the baseline control limit using historical (background) data. Deviations from background concentrations for post remedy concentrations are determined by comparing the measured concentrations for samples to the Shewart-CUSUM control limit. The intra-well method is appropriate for soil gas since there is a high degree of spatial variability in the soil gas concentration across the site. The variability in soil gas concentrations is likely a result of the variability of the waste stream and waste distribution throughout the site. The intra-well method is appropriate for ground water since ground water quality was not impacted prior to remedy implementation and the well locations are located spatially and vertically (i.e., in multiple water bearing zones) apart from one another. Thus, the data at each well defines the background for the well.
4. A database must have certain characteristics for the control chart method to provide reliable results as discussed in EPA, 1989 and Gibbons et al., 2003. Key characteristics include the following:
 - A minimum of eight samples results. A smaller database results in a high false negative rate.
 - The data are independent and normally distributed. Of these, independence is the most important while normality is less of a concern (EPA, 1989 and Gibbons et al., 2003). Since the sampling history has been random in nature, the data are likely independent.
 - Non-detects should not comprise a significant portion of the database (i.e., should be less than 75 percent of the test results).

For databases with less than 8 sample results or less than 25 percent detects for a given constituent, DUMPStat uses a Poisson prediction limit to evaluate the data.

5. Considering the requirements discussed above and as agreed to with the EPA, evaluating trends using the control chart method is suited to the Non-Compliance Soil Gas and ground water analytical results. Most constituents at the soil gas compliance wells are not frequently detected as shown in Table 8. Soil gas results for the compliance wells are compared to the SGPS to assess soil gas migration and potential effects of the remedy on soil gas concentrations. Section 5.3.2 discusses the soil gas compliance well results. The

statistical evaluations for the Non-Compliance Soil Gas wells and ground water wells are provided in Sections 5.3.4 and 5.4.2.6, respectively.

6. The database utilized for statistical analysis includes all monitoring results for each constituent at each monitoring location. When a constituent was measured to be non-detect, one-half of the detection limit was used in the database for that sample episode. In addition, DUMPStat requires the user to specify the value of certain parameters. These include the following along with the specified value:

- h - decision interval value, = 4.5
- k - reference value or allowable slack, = 1
- SCL - upper Shewart Control limit, = 4.5

These values are within the recommended range and result in a more conservative result (EPA, 1989 and Gibbons et al., 2003).

7. DUMPStat automatically identifies and excludes outliers in computing the statistics of mean and standard deviation. This eliminates extreme values that could bias the statistical limits to the high side (Gibbons et al., 2003).

5.0 MONITORING RESULTS

1. Data provided in this report are based on sampling and monitoring events during the first six months of the OM&M (October 2006 through March 2007). In some cases, data collected beyond this timeframe is presented. The data was collected using the procedures referenced in Chapter 4.0 and in the OMMP. Data provided for Vapor Monitoring Wells, Building Modifications (in-business air), and Surface Emissions Monitoring (ambient air) were collected during two sampling events (December 2006 and March 2007). Data for the Reservoir Gas Collection System were collected monthly. Data for the Leachate Monitoring/Control System were collected biweekly during this reporting period. Data for the Ground Water Monitoring Wells were collected from one sampling event in December 2006.

5.1 GAS MIGRATION CONTROL SYSTEM

5.1.1 RESERVOIR GAS COLLECTION SYSTEM RESULTS

1. Monthly samples were collected and analyzed from the reservoir gas collection system influent and effluent from November 2006 through March 2007. The analytical results are summarized in Table 5 and the laboratory reports and Chain-Of-Custodies are included in Appendix B.1. Table 5 also includes data collected in April and May 2007.
2. Methane influent results were low (concentrations ranged from 88 to 380 ppmv or approximately 0.3 to 1.1 pounds per day based on the system flow rate of approximately 50 standard cubic feet per minute (scfm) versus the SCAQMD “active” operation performance criteria of 2.3 pounds per day. Figure 10 provides a graph of the methane data in pounds per day versus time. These methane results are not indicative of high anaerobic generation rates in the waste materials. The fixed gases indicate higher nitrogen and carbon dioxide and lower oxygen levels than in typical ambient air (e.g., typical ambient are nitrogen 79%, oxygen 21%, and carbon dioxide 330 ppmv). The fixed gas results are indicative of aerobic degradation conditions occurring in the waste materials (e.g., oxygen being depleted and carbon dioxide being formed with nitrogen concentrations increasing due to oxygen/carbon dioxide volume changes).
3. The TGNMO inlet levels were low and ranged from non-detect to 3.2 ppmv as methane (equivalent to 0.5 ppmv as hexane) versus the system performance requirement of reducing the TGNMO by 98% or to less than 20 ppmv as hexane. Figure 10 provides a graph of the TGNMO concentration data as hexane versus time. The TGNMO levels indicated only low

levels of volatile organics were present in the gases extracted from under the RCRA C-Equivalent cover.

4. Most of the specific priority pollutant VOCs were either non-detect or in the low parts per billion by volume (ppbv) range (e.g., chloromethane = 5.6 ppbv, acetone = 29 ppbv, vinyl chloride = 3.7 ppbv, 2-butanone = 4.2 ppbv, benzene = 79 ppbv, toluene = 2.3 ppbv, and PCE = 5.7 ppbv) versus the SCAQMD total VOC emission rate of less than 1 pound per day, which would be equivalent to approximately 34,000 ppbv of a compound with a molecular weight of approximately 150. Figure 10 provides a graph of the VOC data in pounds per day versus time.

5.1.2 IN-BUSINESS AIR MONITORING RESULTS (BUILDING MODIFICATIONS)

1. The in-business air monitoring was performed at ten locations around the perimeter of the Site (see Figure 4 for in-business air monitoring locations). A total of 12 samples (ten business locations and two duplicates) were collected during both the First and Second Quarters. The analytical results are summarized in Table 6 along with the historical data from previous in-business air monitoring events. Copies of the In-Business Air Monitoring Data Sheets are included in Appendix A.12 and copies of analytical reports and Chain-Of-Custody forms are included in Appendices B.2 and B.3.
2. The methane results were low for each business location sampled and ranged from non-detect to 18 ppmv (IBM-32) versus the IATL standard of maintaining the methane concentration at or below 1.25% by volume or 12,500 ppmv in the building. The fixed gas results (i.e., nitrogen, oxygen, carbon monoxide, and carbon dioxide) were typical of ambient air results (e.g., approximately 79% nitrogen and 21% oxygen). Results for ambient air locations IBM-24[AMB] and IBM-49 [AMB] are also provided in Table 6.
3. The TGNMO levels ranged from non-detect to 68 ppmv (IBM-50) in the in-business air locations.
4. The analytical results for two specific VOCs in certain business locations were above the IATLs (i.e., benzene in IBM-03B, IBM-22, IBM-37 and IBM-41, and PCE in IBM-37 versus the IATLs of 2.0 ppbv benzene and 10.6 ppbv PCE). The following are constituents that were not detected but which had reporting limits above IATLs:

SAMPLE	DATE	ANALYTE	IATL (ppbv)	RESULT (ppbv)
IBM-21	3/15/07	TCE	0.56	<0.57
IBM-37	3/7/07	1,2-dibromoethane	0.06	<0.076
IBM-41	12/6/06	benzene	2.0	<4.8
IBM-41	12/6/06	1,2-dibromoethane	0.06	<0.25
IBM-41	12/6/06	TCE	0.56	<2.8
IBM-41	12/6/06	Vinyl chloride	0.25	<0.74
IBM-41	12/6/06	1,2-dichloroethane	3.6	<3.8
IBM-41	12/6/06	carbon tetrachloride	0.68	<2.4
IBM-50	12/10/06	benzene	2.0	<2.1
IBM-50	12/10/06	TCE	0.56	<1.2
IBM-50	12/10/06	carbon tetrachloride	0.68	<1.1

5. The specific in-business air monitoring constituents reported above the IATLs are highlighted in Table 6 and discussed further in Chapter 8.0 Conclusions and Recommendations. The other priority pollutant VOCs were either non-detect, in the low ppbv range, and/or below the IATLs for each business location.
6. QA/QC results for the analytical data are presented in Chapter 6.0. Further comments, explanations, and conclusions regarding the results from in-business air sampling are provided in Chapter 8.0 Conclusions and Recommendations.

5.1.3 AMBIENT AIR MONITORING RESULTS

1. Two ambient air sampling stations are monitored in order to provide a baseline for in-business air monitoring results. The outdoor monitoring stations are located outside of the building at 12637 Los Nietos Road (IBM-24[AMB]) and at the southeast corner of the Site near the intersection of Los Nietos Road and Greenleaf Avenue [IBM-49(AMB)], as shown in Figure 4. Two ambient air samples were collected during the First Quarter (no duplicates) and three were collected during the Second Quarter (one duplicate). Ambient air samples were collected concurrently with the in-business air samples. Table 6 presents the results of the current sampling along with historical data from previous monitoring events. Copies of

the Ambient Air Monitoring Data Sheets are included in Appendix A.12 and copies of the analytical reports and Chain-of-Custody forms are included in Appendices B.2 and B.3.

2. The methane results were low for each ambient air location and ranged from 1.6 to 3.3 ppmv versus the IATL standard of maintaining the methane concentration at or below 1.25 percent by volume or 12,500 ppmv in the buildings. The fixed gas results (e.g., nitrogen, oxygen, carbon monoxide, and carbon dioxide) were typical of ambient air results (e.g., typical ambient air nitrogen 79% and oxygen 21%).
3. The TGNMO levels were non-detect for each ambient air location. The specific priority pollutant VOCs were either non-detect, in the low ppbv range, and/or below the IATLs for each location (e.g., benzene = 1.5 ppbv, ethylbenzene = 0.70 ppbv, PCE = 0.25 ppbv, toluene = 5.0 ppbv, and m&p xylenes = 3.1 ppbv).
4. QA/QC results for the analytical data are presented in Chapter 6.0. Further comments, explanations, and conclusions regarding the results from the Ambient Air Monitoring are presented in Chapter 8.0.

5.1.4 SENTINEL BIOVENT SYSTEM

1. The Sentinel Biovent Well System is a secondary Gas Migration Control System for the WDI Site. Vapor samples were not collected from the biovent wells as their purpose is to provide air for aerobic decomposition/biodegradation.

5.2 LEACHATE MONITORING/CONTROL SYSTEM RESULTS

1. The Leachate Monitoring/Control System consists of four leachate collection points, LC-1, LC-2, LC-3, and LC-4. The leachate collection wells are located within the reservoir area of the Site as shown in Figure 3. Table 7 and Figure 11 show leachate levels measured during monitoring and prior to bailing activities. Copies of Leachate Collection Well Monitoring Data Sheets are included in Appendix A.8.
2. The leachate collection well LC-1 had liquid levels between 1.4 and 6.3 feet above the bottom of the well from October 2006 through March 2007. However, the liquid levels generally ranged between 2 and 3 feet. There was minimal fluctuation in liquid levels during this monitoring period.

3. Leachate collection well LC-2 had liquid levels between 7.0 and 10.1 feet above the bottom of the well from October 2006 through March 2007. However, the liquid levels generally ranged between 7 and 9 feet during this monitoring period.
4. The leachate collection well LC-3 had liquid levels between 0.70 and 1.4 feet above the bottom of the monitoring well from October 2006 through March 2007. Liquid levels were generally around 1.0 foot during this monitoring period and remained relatively constant.
5. The leachate collection well LC-4 had liquid levels between 3.8 and 14.4 feet above the bottom of the monitoring well from October 2006 through March 2007. Liquid levels generally ranged between 8 and 10 feet above the bottom of the wells, but there were fluctuations in liquid levels in this well.
6. An automated pumping system has currently been designed and approved for wells LC-2 and LC-4, which will replace bailing activities that are currently occurring twice a week at these wells. Installation of the pumping system is expected to be completed in the Fourth Quarter of 2007.

5.3 SOIL GAS MONITORING SYSTEM

5.3.1 VAPOR WELL MONITORING RESULTS

1. There are 20 vapor monitoring well locations around the WDI Site that are designated for long-term monitoring purposes. Each vapor monitoring well location contains nested wells (i.e., there are multiple screened depths at which the soil vapor can be sampled at each well location). The vapor monitoring well locations are shown in Figures 3 and 4. The 20 vapor well locations contain 50 nested wells.
2. Table 8 summarizes the data from the laboratory analyses of the Vapor Well samples along with available historic data. Vapor Wells designated as "Compliance Vapor Wells" are listed first in the table followed by "Non-Compliance Vapor Wells". The designation of compliance and non-compliance wells is described in Section 4.3.1. Copies of the Soil Vapor Monitoring Data Sheets are included in Appendix A.6 and copies of the analytical reports and Chain-of-Custody sheets are included in Appendices B.4 and B.5.

3. The results for the Compliance and Non-Compliance Vapor Wells sampled during the first and second quarter monitoring events are described below.

5.3.2 COMPLIANCE WELLS (VW-29 TO -39, -41, AND -42)

1. The methane results were low for each well location sampled and ranged from non-detect to 2.9 ppmv versus the SGPS of 5% (i.e., 50,000 ppmv) at the Site boundary. The exception to this was VW-38-D where methane was measured between 1,700 and 1,800 ppmv, although these results are still less than the SGPS standard for methane.
2. The fixed gas results (e.g., nitrogen, oxygen, carbon monoxide and carbon dioxide) indicate nitrogen levels close to or above typical ambient air (79% nitrogen), oxygen levels close to or below typical ambient air (21% oxygen), and carbon dioxide levels above typical ambient air of 330 ppmv. The carbon dioxide concentrations in soil gas ranged between less than 1,700 and 129,000 ppmv. The fixed gas results are indicative of aerobic degradation conditions occurring in the soils (e.g., oxygen being depleted and carbon dioxide being formed). As discussed below, for the non-compliance wells, the concentration trend for oxygen is down and the trend for carbon dioxide is up suggesting the site's subsurface conditions may generally be transitioning from anaerobic to aerobic decomposition. This conversion could have an influence on soil gas migration and thus composition changes in compliance wells.
3. The TGNMO levels were low in each vapor well location and ranged from non-detect to 11 ppmv. There is no SGPS for TGNMO in Compliance Vapor Wells; however, the results are consistent with the low concentrations of the total VOCs.
4. The analytical results for a few specific VOCs in certain well locations were above the SGPS (i.e., benzene in VW-29-S, VW-30-I, VW-34-S, VW-34-I, VW-34-D, VW-35-S, VW-35-D, VW-36-D, VW-37-D, VW-38-D, VW-39-D, VW-41-D, VW-42-S and VW-42-D; chloroform in VW-35-D, and TCE in VW-35-D versus the SGPS of 10 ppbv benzene, 20 ppbv chloroform, and 200 ppbv TCE).

The following are constituents that were not detected but which had reporting limits above SGPSs:

SAMPLE	ANALYTE	DATE	SGPS (ppbv)	RESULT (ppbv)
VW-35-S	1,2-dibromoethane	3/13/07	1.0	<1.0
VW-35-D	1,2-dibromoethane	12/12/06	1.0	<7.8
VW-35-D	1,2-dibromoethane	3/13/07	1.0	<5.3
VW-35-D	benzene	12/12/06	10.0	<19.0
VW-35-D	vinyl chloride	12/12/06	10.0	<23.0
VW-35-D	vinyl chloride	3/13/07	10.0	<16.0
VW-38-D	1,2-dibromoethane	12/14/06	1.0	<2.1

5. The monitoring constituents reported above the SGPS are highlighted in Table 8 and discussed further in Chapter 8.0 Conclusions and Recommendations. The other priority pollutant VOCs were either non-detect, in the low ppbv range, and/or below the SGPS for each constituent.
6. QA/QC results for the analytical data are presented in Chapter 6.0. Further comments, explanations, and conclusions regarding the results from the Compliance Vapor Wells are provided in Chapter 8.0.

5.3.3 NON-COMPLIANCE WELLS (VW-25, -46, -49, -51, -55, -56, -58, -61, AND -62)

1. The methane results were low for each well location sampled and ranged from non-detect to 49,300 ppmv (VW-55-S) versus the SGPS of 5% (i.e., 50,000 ppmv) for compliance wells at the Site boundary. In general, it is noted that methane concentrations have decreased significantly, and in some cases, by severe orders of magnitude, from concentrations prior to remedy implementation.
2. The fixed gas results (e.g., nitrogen, oxygen, carbon monoxide, and carbon dioxide) indicate nitrogen levels typically above typical ambient air (79% nitrogen), oxygen levels below typical ambient air (21% oxygen), and carbon dioxide levels above typical ambient air (330 ppmv). The fixed gas results are indicative of aerobic degradation conditions occurring in the soils (e.g., oxygen being depleted and carbon dioxide being formed). The concentration trend

for oxygen decreasing and carbon dioxide increasing coupled with a decrease in methane concentration during remedy implementation suggests the site may generally be transitioning from anaerobic to aerobic decomposition.

3. The TGNMO levels were low in each vapor well location and ranged from non-detect to 430 ppmv (VW-51-D). There is no SGPS for TGNMO in Non-Compliance Vapor Wells; however, the results are consistent with the low concentrations of the total VOCs.
4. The specific priority pollutant VOC concentrations ranged from non-detect to levels similar to historical maximum concentrations in Non-Compliance Vapor Well locations (e.g., 1,2-dichloroethane = 32 ppbv in VW-51-D, PCE = 600 ppbv in VW-49-D, and TCE = 280 ppbv in VW-58-I). Benzene increased above historical maximum concentrations in several Non-Compliance Vapor Wells during the Second Quarter event (e.g., 29 ppbv in VW-25-S, 110 ppbv in VW-46-S, 34 ppbv in VW-49-S, 260 ppbv in VW-49-I, 49 ppbv in VW-55-S, 92 ppbv in VW-55-I, 42 ppbv in VW-55-D, 290 ppbv in VW-56-I, 130 ppbv in VW-58-S, 90 ppbv in VW-61-S, 44 ppbv in VW-62-S, and 160 ppbv in VW-62-I). There are no SGPSs for VOC constituents in Non-Compliance Wells. These and other results are discussed further in Chapter 8.0 Conclusions and Recommendations.
5. QA/QC results for the analytical data are presented in Chapter 6.0. Further comments, explanations, and conclusions regarding the results from the Non-Compliance Vapor Wells are provided in Chapter 8.0.

5.3.4 STATISTICAL ANALYSIS OF NON-COMPLIANCE VAPOR WELL ANALYTICAL DATA

1. Section 4.6 provides a detailed discussion of the purpose and approach to statistical analysis of the Non-Compliance Vapor Wells. The primary purpose of statistical analysis is to identify statistically significant concentration changes of the 18 soil gas performance standard compounds. Statistically significant changes can be an indicator of important changes occurring in the soil gas following remedy implementation. This section discusses the findings of the statistical analysis for the soil gas data collected during the First and Second Quarters of 2006-2007. The results of the DumpStat analysis are provided in Appendix C.1.

2. The results indicate control limit (Poisson or CUSUM) exceedances at 8 out of 9 Non-Compliance vapor well locations. At the 9 Non-Compliance vapor well locations, a total of 25 nested wells are in place. At 19 of the 25 nested wells, a control limit exceedance was identified for one or more of the soil gas constituents of concern. These exceedances are summarized in Table 9.
3. Table 9 illustrates there were 21 exceedances of the Poisson Prediction Limit and 19 exceedances of the CUSUM Limit for some of the compounds with a SGPS at the 25 nested well locations during the First and Second Quarters (a total of 40 out of 1800 possible exceedances). There were no significant upward trends and 2 significant downward trends.
4. The AROD (EPA, 2002) identified 18 compounds for which a SGPS is stated. Exceedances of a statistical limit were determined for 11 of the 18 compounds at one or more of the nested wells. Benzene exceeded a statistical limit in 16 of the 25 nested well locations. Methane exceeded a limit in 7 of the 25 nested wells with the remaining 9 compounds exceeded a statistical standard at 2 or fewer nested wells.
5. Comparing the statistical analysis results for the vapor well probes over time indicates the following:
 - 5 limit exceedances for samples collected during Compliance Testing (TRC, 2006c)
 - 13 limit exceedances during the First Quarter, and
 - 27 limit exceedances during the Second Quarter.
6. The absence of upward concentration trends, coupled with a sharp increase in the number of limit exceedances over time, suggests that the changes in constituent concentration may be associated with an overall change in the soil gas generation/decomposition process. If a gradual change in concentration were occurring, significant upward trends should have been identified in addition to limit exceedances. Section 8.3 discusses the possibility that the soil gas generation process may be transitioning from the slow anaerobic decomposition process that was present prior to remedy implementation to the more rapid aerobic decomposition process. This change in degradation process may be causing a change in soil gas migration and soil gas constituent concentration.

5.4 GROUND WATER MONITORING SYSTEM

5.4.1 GROUND WATER MONITORING PROGRAM

1. The Long-Term Ground Water Monitoring Plan includes monitoring of field parameters (listed in ground water monitoring data sheet), and ground water sampling and analysis of COCs identified in the AROD. The ground water COCs include benzene, xylenes, vinyl chloride, arsenic, lead, manganese, mercury, toluene, carbon tetrachloride, chloroform, PCE, and TCE. The MCLs for the Site COCs are listed in Table 4. The results of the ground water analyses are included in Table 10 along with historical results. Depth to ground water measurements and ground water elevations are included in Table 11. The results above MCLs in Table 10 are highlighted. Copies of the laboratory reports and Chain-of-Custody sheets are included in Appendix D.
2. In accordance with Title 22 California Code of Regulations (CCR) §66265.97, the ground water detection monitoring program includes background wells, POC wells, and other wells suitable for early detection of a release from a waste unit (e.g., Near Source Detection Wells and Verification Wells). Twelve wells were selected for the proposed ground water monitoring at the Site based on ground water conditions, flow, and distribution of contaminant sources. The locations of selected long-term ground water monitoring wells are shown in Figures 3 and 4.

5.4.2 GROUND WATER MONITORING RESULTS

5.4.2.1 Background Wells

1. Background wells are onsite or offsite wells that have not been impacted by Site activities (typically they are located upgradient or cross-gradient of the Site). The background wells are screened within the uppermost aquifer to monitor and document onsite-impacted ground water quality. The selected background wells for the Long-Term Ground Water Monitoring Plan include wells GW-01, -02 and -32. In addition, well GW-11 was also monitored for deep background cross-gradient ground water quality. The locations of background wells are shown in Figures 3 and 4. These wells are also situated such that they will continue to monitor contaminants derived from offsite upgradient sources.
2. Manganese was detected above the MCL level (i.e., 0.05 mg/L) in GW-11 (0.13 mg/L) and GW-32 (0.094 mg/L). Manganese was not detected in well GW-1 or GW-2. Arsenic, lead, and mercury were not detected in the background wells.

3. PCE was detected above the MCL level (5 µg/L) in GW-11 (15-17 µg/L). PCE was not detected in the other background wells. TCE was detected in GW-11 but was below the MCL (5 µg/L). Other VOCs were not detected in the background wells. These constituents have been detected in the past and are related to an offsite source.

5.4.2.2 Points of Compliance Wells

1. POC wells are onsite monitoring wells located at the POC (i.e., downgradient edge of the waste unit). The POC wells are screened within the uppermost aquifer to monitor and detect potential releases and impacts to ground water from site-related waste sources. Based on hydrogeologic conditions at the Site, shallow aquifer POC wells, approximately 200 feet apart, were selected for long-term detection monitoring. The selected POC wells include ground water wells GW-22, -23, and -26.
2. Manganese was detected above the MCL in GW-23 (0.36 mg/L), at the MCL in GW-22 (0.05 mg/L), and below the MCL in GW-26 (0.032 mg/L). Arsenic, lead, and mercury were not detected in the POC wells. Manganese concentrations have been shown to be consistent with regional ground water quality.
3. VOCs were not detected in the POC wells.

5.4.2.3 Near-Source Detection Wells

1. Near-Source Detection Wells are onsite detection wells located near the waste source areas. The objective of near-source detection wells is to detect potential site-related releases of contaminants before impacts are measured at the POC wells. The near-source wells are located closer to the waste unit than POC well or are located directly below waste. Wells GW-10 and -33 were selected as near-source detection wells for long-term ground water monitoring.
2. Manganese was detected above the MCL in GW-10 (0.26 mg/L). Arsenic, lead and mercury were not detected in GW-10. Manganese, arsenic, lead, and mercury were not analyzed in GW-33 due to the use of inappropriate sample containers in the field. These metals will be analyzed during future monitoring events. Manganese concentrations have been shown to be consistent with regional ground water quality.
3. VOCs were not detected in GW-10 or GW-33.

5.4.2.4 Verification Wells

1. The verification wells are onsite wells located near the property line of the Site, downgradient of the Site waste source. The verification wells are included to assure that Site contaminants are not migrating offsite and potentially impacting private or municipal water supply wells. The existing downgradient monitoring wells GW-27, -29, and -30 serve as verification wells for long-term ground water monitoring purposes.
2. Manganese was detected above MCLs in GW-27 (0.079 mg/L) and GW-29 (0.058 mg/L). Arsenic, lead, and mercury were not detected in GW-27 or GW-29. Manganese, arsenic, lead, and mercury were not analyzed in GW-30 due to the use of inappropriate sample containers in the field. These metals will be analyzed during future monitoring events. Manganese concentrations have been shown to be consistent with regional ground water quality.
3. VOCs were not detected in GW-27, GW-29, or GW-30, with the exception of dibromochloromethane in GW-27 at a concentration of 2.2 µg/L.

5.4.2.5 Quality Assurance/Quality Control

1. QA/QC results for the analytical data are presented in Chapter 6.0. Further comments, explanations, and conclusions regarding the results from the Ground Water Monitoring are presented in Chapter 8.0.

5.4.2.6 Statistical Analysis of Ground Water Analytical Data

1. Section 4.6 discusses the approach to statistical analysis of analytical data. The statistical analysis results for ground water data are discussed in this section.
2. Table 10 provides the historic and current results of analytical testing of ground water. Statistical analysis was performed on this data. The COCs as defined in Table 5.1 of the OMMP and also in Table 4, herein. Appendix C.2 provides the results of the statistical analysis for ground water.
3. The results indicate the ground water data to be in control,(i.e., only two exceedances of a prediction limit occurred). The two prediction limit exceedances occurred for manganese at wells GW-22 and GW-29. Manganese is a naturally occurring constituent in the regional

ground water below the site. Significant trends were not identified. These results are consistent with results for ground water discussed in Section 5.4.2 which indicated no unusual exceedances of ground water COCs.

5.5 STORMWATER MONITORING RESULTS

1. Stormwater sampling was not conducted between October 2006 and March 2007 due to low rainfall events (e.g., less than 2 inches of rainfall in 24 hours). Routine inspections of monitoring points and stormwater drainage control systems were conducted during this reporting period and the results are presented in Section 3.4 and Appendix A.7.

6.0 QUALITY ASSURANCE/QUALITY CONTROL

6.1 TRIP/FIELD BLANK AND BACKGROUND ANALYSIS RESULTS

1. The soil gas, in-business air, ambient air and ground water monitoring included Summa canister certifications and the analysis of trip/field blanks, duplicates and collection and analysis of background ambient air samples during the First and Second Quarter monitoring and sampling activities. The results for these samples are discussed below and the laboratory analytical results are included in Appendices B and D. Duplicate sample results are included in the corresponding analytical tables noted in Chapter 5.0, Monitoring Results.

6.1.1 IN-BUSINESS AIR AND AMBIENT AIR MONITORING

1. A certification was performed on each lot of in-business and ambient air Summa canisters received from the laboratory. The certifications passed the laboratory requirements for the lots received (e.g., non-detect for TO-15 constituents). Copies of the laboratory certifications are included in Appendix A.11.
2. Trip/field blanks and background sampling are not required for in-business and ambient air monitoring. However, due to some confusion with the requirements for vapor well monitoring, three trip/field blank samples were analyzed during the Second Quarter in-business air monitoring event. Methane, TGNMO, and VOCs were not detected in the trip/field blank samples.
3. Five duplicate samples were collected and analyzed during the reporting period. The duplicate sample results are included in Table 6 and, in general, are comparable with the results for the primary samples.

6.1.2 VAPOR WELL MONITORING

1. A certification was performed on each lot of vapor well Summa canisters received from the laboratory. The certifications passed the laboratory requirements for the lots received (e.g., non-detect for TO-15 constituents). Copies of the laboratory certifications are included in Appendix A.11.
2. Three trip/field blank samples were analyzed during the First Quarter and two trip/field blank samples were analyzed during the Second Quarter vapor well monitoring events. Methane, TGNMO, and VOCs were not detected in the trip/field blank samples.

3. Ten duplicate samples were collected and analyzed during the reporting period. The duplicate sample results are included in Table 8 and, in general, are comparable with the results for the primary samples, with the exception of acetone and 2-butanone for VW-55-I.
4. Background ambient air samples were collected at Vapor Wells VW-42 and VW-62 during the First Quarter vapor well monitoring event. Due to some confusion with the requirements for in-business and ambient air monitoring, background samples were not collected during the Second Quarter vapor well monitoring event. The background samples will be collected during future monitoring events. The background ambient air sample analytical results are included in Table 8. Methane was detected between 2 to 3 ppmv and some VOCs (i.e., acetone, methylene chloride, carbon disulfide, vinyl acetate, 2-butanone, benzene, toluene, PCE, ethylbenzene, m,p-xylene and o-xylene were detected in the range of 0.23 ppbv to 15 ppbv.

6.1.3 GROUND WATER MONITORING

1. Three trip, three field blanks and three equipment rinsate samples were analyzed during the First Quarter ground water monitoring event. COC metals and/or VOCs were not detected in the trip blanks, field blanks or equipment rinsate samples.
2. Two duplicate samples were collected and analyzed during the reporting period. The duplicate sample results are included in Table 10 and are comparable with the results for the primary samples.

6.2 DATA VALIDATION RESULTS

1. The soil gas, in-business air, ambient air, and ground water samples collected and analyzed during the First and Second Quarter monitoring and sampling activities along with the associated laboratory samples and the QA/QC data were reviewed by Veridian Environmental, Inc. (Veridian), located in Davis, California. The Veridian findings are summarized below and were based on comprehensive reviews of Level III deliverables from Columbia Analytical Services, Inc. for the soil gas, in-business air, and ambient air samples and Level II deliverables from TestAmerica for the ground water samples with regard to holding times, blank analysis results, surrogate recoveries, laboratory, and field duplicate recoveries, internal standard recoveries, analytical sequence and instrument sensitivity. Most of the data was found to meet the general requirements for compliance, accuracy, and precision. The data that did not meet the general requirements are summarized below.

6.2.1 VALIDATION FOR FIRST QUARTER VAPOR SAMPLING

1. Eight out of 72 vapor well, in-business air, and ambient air samples (including trip/field blanks and field quality control samples, but not including laboratory duplicate samples) that were analyzed by Columbia Analytical Services, Inc. were validated by Veridian Environmental, Inc. (greater than 10% of the total number of vapor samples). The samples validated were VW-46-I, IBM-41, IBM-03B, VW-31-S, VW-38-D, VW-55-S, VW-61-D and VW-51-D.
2. Vapor well sample VW-61-D-12-20-06 was analyzed by EPA Methods 3C and 25C outside of the 14-day holding time specified in the QAPP. Although this data was qualified, there was evidence that some target analytes may be stable over longer periods of time and, consequently, the data may be valid as reported. TRC notes that the QAPP actually contains a discrepancy regarding the method holding times; it also refers to a 30-day holding time for EPA Methods 3C and 25C. This discrepancy in the QAPP will be corrected for future monitoring events.
3. Analytical results may be higher than reported by the laboratory (UJ/J) due to high percent differences coupled with decreased instrument sensitivity in continuing calibration standards for the following results:
 - TGNMO results for IBM-03B and VW-31-S;
 - Vinyl chloride results for IBM-03B and VW-31-S; and
 - Trichlorotrifluoroethane for VW-61-D.
4. For additional details refer to the Columbia Analytical Services, Inc. laboratory reports in Appendices B.2 and B.4 and the Veridian Environmental Data Validation Report, in Appendix E.1.

6.2.2 VALIDATION FOR SECOND QUARTER VAPOR SAMPLING

1. Eight out of 76 vapor well, in-business air, and ambient air samples (including trip/field blanks and field quality control samples, but not including laboratory duplicate samples) that were analyzed by Columbia Analytical Services, Inc. were validated by Veridian Environmental, Inc. (approximately 10% of the total number of vapor samples). The samples validated were VW-56-S, VW-58-I, VW-62-S, VW-62-S-SC, VW-62-I, VW-62-D, IBM-22, and IBM-37.

2. In-business air sample IBM-22 was analyzed by EPA Method 3C outside of the 14-day holding time specified in the QAPP. Although this data was qualified, there was evidence that some target analytes may be stable over longer periods of time and, consequently, the data may be valid as reported. TRC notes that the QAPP actually contains a discrepancy regarding the method holding times; it also refers to a 30-day holding time for EPA Methods 3C and 25C. This discrepancy in the QAPP will be corrected for future monitoring events.
3. Vinyl acetate detected in vapor well sample VW-62-D may be lower than reported due to matrix interference. The laboratory identified the matrix interference as due to difficulty in distinguishing the quantitative ions between vinyl acetate, acetone, and 1,3-butadiene.
4. Analytical results for TGNMO may be lower than reported by the laboratory due to increased instrument sensitivity in continuing calibration standards for vapor well samples VW-56-S, VW-58-I, VW-62-S, VW-62-S-SC, VW-62-I, and VW-62-D.
5. Due to a high concentration of PCE in in-business air sample IBM-37, the TO-15 analysis was conducted at a lower volume, causing the detection limit for 1,2-dibromoethane (0.076 ppbv) to be above its IATL (0.06 ppbv).
6. For additional details refer to the Columbia Analytical Services, Inc. laboratory reports in Appendices B.3 and B.5 and the Veridian Environmental Data Validation Report for the Second Quarter, in Appendix E.2.

6.2.3 VALIDATION FOR FIRST QUARTER GROUND WATER SAMPLING

1. One randomly selected sample (MW-10) out of 23 ground water samples (including trip/field/rinseate blanks and field quality control samples, but not including laboratory duplicate samples) that were analyzed by TestAmerica, Inc. were validated by Veridian Environmental, Inc. Only one out of 23 ground water samples was validated since the total number of vapor and ground water samples validated was 17 out of a total of 171 samples (or ~ 10% of all samples including trip/field/rinseate blanks and field quality control samples, but not including laboratory duplicate samples). Ten percent validation of the samples is required by the QAAP and OMMP.
2. A high percent recovery was reported for bromomethane (173%) in the laboratory control sample (LCS) associated with sample MW-10, but qualification was not warranted since bromomethane was not detected in MW-10.

3. Since the volatile organic matrix spike/matrix spike duplicate analysis was not performed on sample MW-10, the matrix spike results were not evaluated. Consequently, volatile organic matrix effects could not be determined for the sample. The laboratory did not perform a semi-volatile matrix spike. Instead, the laboratory prepared and analyzed a laboratory control/laboratory control duplicate pair. Consequently, semi-volatile organic matrix effects could not be determined for the sample
4. Since samples MW-22 and MW-10 were analyzed in the same batch by the laboratory, the same matrix spike/matrix spike duplicate for dissolved metals used for MW-22 was also used for MW-10. High relative percent differences were reported for aluminum (28%) and iron (28%) between the matrix spike and matrix spike duplicate for sample MW-22, but qualification of the data was not warranted since aluminum and iron were not detected in MW-10. Also, since the sample concentrations of calcium, magnesium, and sodium were greater than four times the spike level, matrix effects for inorganics could not be determined.
5. Calcium, sodium, and total dissolved solids detected in MW-10 were greater than five times the concentrations in field blank FB-1 and, as a result, qualification of these analytes was not warranted.
6. With regard to data usability, the data for sample MW-10 was evaluated as acceptable without qualification.
7. For additional details refer to the TestAmerica, Inc. laboratory reports in Appendix D and the Veridian Environmental Data Validation Report for the First Quarter in Appendix E.3.

7.0 INSTITUTIONAL CONTROLS MONITORING AND ENFORCEMENT REPORT

7.1 SITE DESCRIPTION

1. This section provides a monitoring and inspection report in accordance with the Institutional Controls Monitoring and Enforcement Work Plan (ICMEWP) for the Waste Disposal Inc. Superfund Site, dated November 28, 2005. The WDIG Site Trust conducts quarterly Institutional Control monitoring and enforcement inspections of the properties at the WDI Site for which an Environmental Restriction Covenant (ERC) has been recorded. In addition to the quarterly formal inspections, informal inspections are conducted each time a project team representative visits the site/parcel(s).
2. This ICMEWP report will be a part of the Semi-Annual and Annual OM&M Reports. The inspection and reporting began with the 2006-2007 OM&M time period. The annual period begins October 1 and ends September 30.
3. The ICMEWP contains Institutional Control and Environmental Restriction Covenant monitoring and enforcement provisions to limit human exposure to potentially contaminated materials as well as protect the integrity of the remedial action. It is the responsibility of the WDIG Site Trust to monitor the ERCs and enforce violations on all properties where an ERC has been recorded.

7.2 ICMEWP REQUIREMENTS

1. Institutional Controls (ICs) are required by the AROD to ensure the long-term integrity of the remedy and to prevent exposure to waste remaining at the Site. In general, the purpose and objectives of the ICs are:
 - To provide notification to all potential Site users of the presence of hazardous materials and on-Site contamination;
 - To provide notification to potential Site users concerning the presence and location of all remedial systems;
 - To expressly prohibit residential land use on any part of the Site and limit future uses to certain industrial activities;
 - To minimize the potential for exposure of future Site users to Site related hazardous materials (including waste materials, groundwater, and/or soil gas emissions);

- To protect the integrity of the remedy from any activity that may interfere with the effective O&M of remedial control and monitoring systems;
 - To provide access to the Site for appropriate regulatory agencies and responsible parties engaged in approved remedial actions and monitoring activities.
2. ERCs are the legal instruments that define and enforce the ICs. The primary purpose of the ERC is to protect present or future human health or safety or the environment as a result of the presence on the land of hazardous substances. The CD requires the WDIG Site Trust to be the covenantee of the ERCs and part of its responsibilities as covenantee include monitoring and enforcing the ERCs. These ERCs are enforceable under California Law against all future property owners and tenants. The ERCs will provide access on the land to the EPA and the potentially responsible parties (PRPs) conducting the remedial action and their contractors. The following activities are examples of ERC requirements:
- Monitoring the remedial action and monitoring and O&M;
 - Verifying any data or information submitted to EPA or the State;
 - Conducting investigations relating to contamination at or near the Site;
 - Obtaining samples;
 - Assessing the need for, planning, or implementing additional response actions at or near the Site;
 - Assessing implementation of quality assurance and quality control practices as defined in the approved Quality Assurance Project Plans;
 - Implementing the remedial action, monitoring, and O&M;
 - Assessing compliance with the access easements and environmental restrictions; and
 - Determining whether the Site or other property is being used in a manner that is prohibited or restricted by the environmental restrictions, or that may need to be prohibited or restricted.
3. *The ERCs also include land and water use restrictions to prohibit and restrict certain activities at the Site that may adversely affect the implementation, integrity, or protectiveness of remedial measures. The owners and occupants must comply with these restrictions, unless*

approved by EPA. The following activities are examples of ERC requirements for land/water restrictions:

- Placement of warning signs or other posted information shall be allowed and, once posted, no removal or interference with such signs or information shall be permitted.
 - Placement of Site access controls, such as gates or fencing, shall be allowed and not damaged or circumvented.
 - The Site shall not be used in any manner that may interfere with the integrity of the remedial cap or other components of the remedy.
 - Construction not approved by EPA that impacts any of the remedial capping or other remedy components shall not occur.
 - No interferences with or alternations to the grading, vegetation, and surface water drainage controls shall be made.
 - Portions of the Site or property underlain by waste and in soil gas noncompliance shall not be regraded.
 - Areas of asphalt or concrete pavement shall not be removed or improved.
 - No penetrations or interferences with the remedial cap or areas with remedial controls shall be made.
4. In addition, the ERCs provide that if an Owner or an Occupant constructs a new building or other permanent structure on the property or substantially modifies an existing building or other permanent structure on the property, and such modification requires a City of Santa Fe Springs building or land use permit, Owner or Occupant shall implement and maintain any necessary engineered capping system(s) and any necessary engineering control(s) related to the new or modified building or other permanent structure, in conformance with the provisions of the AROD and as specified by EPA. Such capping systems and engineering controls shall be implemented only with the prior written approval of EPA.

7.3 MONITORING AND INSPECTION FINDINGS FOR THE FIRST HALF OF 2006-2007

1. The primary purpose of the ICMEWP is to document and report any violation of the ERC. To facilitate identifying violations of the ERC, a checklist was developed and included in Figure 4 of the ICMEWP. A copy of each checklist will be included in reports to the EPA for each parcel. This approach recognizes that inspection and monitoring obligations are

parcel specific. Thus, Appendix F presents a checklist for each parcel. The ICs have been categorized on the checklist into the various site controls to facilitate evaluating compliance.

2. The checklist presents a plan view of key features at each parcel, an overview of parcel information, and the results of inspection of the applicable site controls. The plan view includes an aerial view of the parcel, as well as a plan showing the cover and monitoring features installed within the parcel. Each of these two detailed views is referenced to an overall plan of the site (i.e. a Key Plan).
3. For each of the established site controls, the approach to inspection and monitoring is stated, and the findings listed. When “inspection” is indicated, this is indicative of a physical site visit, while when “monitoring” is indicated, this is indicative of remote review of land use and activity records. Dependent upon the site control objective, an appropriate combination of inspection and monitoring is applied.
4. While routine visits to the site occur periodically, formal inspections are conducted to support completion of the IC Checklist. Ongoing land use and activity monitoring occurs continuously throughout the monitoring period.
5. Occasionally maintenance is required. Compliance with the site requirements is evaluated after the maintenance is performed. Any maintenance required to restore site control is listed as “Remedial Action” within the IC Checklist.

7.3.1 PARCEL INFORMATION

1. The force of the ERC is derived from the knowledge of the landowner and their tenants of the land use and activity limitations imposed by the ICs. Therefore, the routine confirmation of current ownership and occupancy across the site establishes ownership and occupancy, and would elucidate any new owners and tenants.
 - **Inspection and Monitoring Approach.** The ownership of properties is monitored by a record review derived from Los Angeles County Land Records. The tenancy is derived from a site inspection.
 - **Summary Findings.** Tables 1 and 12 describe the site ownership and tenancy, respectively. There have been no property sales since the last update of Table 12. New tenants are present at the site and included in Table 1.

2. Below are described the various site controls included in the Checklist and the approach to compliance inspection. The findings of the inspection are provided on the checklist, Appendix F, with key findings discussed in Section 7.3.

7.3.2 SIGNAGE

1. Signage is utilized at the site to provide hazard notice to third parties.
2. Figure 4.5 of the OMMP provides signage locations at the Site. During the inspection, Site conditions were compared to this figure. Signage is not present on all parcels, and therefore the IC Checklist specifies "N/A" for those parcels where signage was not provided. The presence and condition of the sign is verified through site inspection.

7.3.3 REMEDY INTEGRITY

1. The broad objective is preserving the integrity of the Subtitle C & D equivalent covers and the overlying drainage features. The IC Checklist incorporates nine site controls that serve to preserve remedy integrity.
2. Site controls were inspected as applicable. These included inspections of fencing, RCRA C & D equivalent covers, new construction, grading and drainage systems, as well as controlling vegetation, and assuring no waste is excavated without EPA approval. Figures 4.0 and 4.4 of the OMMP were referenced during the inspection. Monitoring was performed to detect and prevent any excavations or new construction that could contact the waste or remedy components.

7.3.4 VEGETATION

1. This site control limits any new plants, changes to and use of irrigation and pesticide/herbicide use unless approval is provided. Inspection is utilized to observe for any new plantings or irrigation changes.

7.3.5 LIQUIDS RECOVERY SYSTEM

1. A liquids control system is present in Parcel 26. This system is inspected to assure that it is not interfered with.

7.3.6 DRAINAGE

1. This site control seeks to preserve the integrity of the drainage system that was installed as part of the remedy. Figures 4.0 and 4.4 of the OMMP are utilized during the inspection to locate components. Drainage channels or pipes should not be blocked, rerouted or otherwise interfered with.

7.3.7 GAS CONTROLS

1. This site control seeks to preserve the integrity of gas controls whether they are placed outside or within a building interior.
2. Maintenance of these controls is through inspection. Buildings that overlie waste will have their slabs and/or foundations inspected for integrity. If and when controls or sensors are placed indoors, they shall be inspected to record that they have not been circumvented. Similarly, when alarm systems are in-place, they too shall be inspected to see that they have not been interfered with. There are presently no parcels with indoor gas controls, sensors or alarms installed as part of the remedy. Figure 4.0 of the OMMP was used to identify parcels where the cover consisted of concrete with sealed cracks. These were inspected for continued integrity and the presence of unsealed cracks.

7.3.8 MONITORING POINTS

1. The Site contains numerous monitoring points including ground water monitoring wells, soil gas probes, reservoir leachate collection wells, biovent wells, and survey monuments. The site controls seek to preserve these points, maintain labeling, allow access and check they are secured. In addition, new monitoring wells and water supply wells are prohibited from being installed.
2. The condition of the monitoring points is visibly inspected by parcel, and maintenance is performed as needed. Figures 4.0, 4.1, and 5.0 of the OMMP are utilized to locate the monitoring points for inspection. The placement of new monitoring wells or water wells is

monitored through the use of the excavation clearance system, as well as by visual inspection.

7.3.9 REGULATIONS

1. This Site control is administrative, and preserves the right of access to the properties, as well as establishes the compliance requirements for Waste Discharge Requirements and Hazardous Waste Disposal requirements.

7.4 KEY CHECKLIST FINDINGS

1. The findings of the ICMEWP inspections and monitoring are provided in Appendix F. All Site Control items were found to be in compliance for all parcels and a 'yes' is entered against the item. For Site Control items that do not apply to a parcel, a N/A is entered against the item to so indicate. For those items that are not in compliance, a 'No' will be entered against the item and further discussion provided.
2. Although no Site Controls were out of compliance, a few observations were made or notifications received that are discussed below:
 - **Parcel 26** - A shrub on the northeast corner of the parcel was observed and is being removed as part of routine O&M activities. Weeds were observed to be growing in the asphalt lined drainage v-ditch located on the west side of the parcel and are being removed/eradicated as part of routine O&M activities.
 - **Parcels 28 & 29** – Maintenance and/or modifications were observed to have been completed on previously permitted buildings. Discussion with the owner indicates new permits were not required and that penetrations through the RCRA D Equivalent cover (i.e., Engineered Concrete Cover with Sealed Cracks) did not occur.
 - **Parcel 44.** On March 23, 2007, notice was received by WDIG from the Southern California Underground Service Alert. The planned event was the replacement of gas service to the parcel. Because excavation work is required to be monitored by the WDIG, notice of the pending work was provided to WDIG. This invoked communication with USEPA and the contractor. WDIG observed the excavation on March 28 & 29, 2007. Based on visual observation (lack of black staining) and soil smell (no crude oil or refined petroleum product odor), contaminated soil was not encountered during the excavation. The soil smell was that of natural soil only. Occasional asphalt pieces were present in the excavated soil.

The site inspection indicated that brackets holding the site security fencing to the fence posts are coming loose due to the pressure of the sand bags that are placed against the fence for sediment control. The brackets are being reattached to the fence post and the sand bags removed from the area since sediment control is no longer required in this area. This activity is being completed as part of routine O&M activities.

3. Access to Parcels 22 and 37 was not able to be scheduled during the site inspections for this period. Three or more attempts were made to coordinate an inspection schedule for the above parcels during the monitoring period. The Parcel 22 inspection was not scheduled because of tenant activities that required use of most of the available floor space. An inspection of the sealed crack remedy component under these conditions would have been inconclusive. Inspection of Parcels 22 and 37 is being scheduled for future monitoring periods. Access to Units 9 and 10 of Parcel 41 could not be gained. All other units present on Parcel 41 indicated compliance with the IC checklist items.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 GAS MIGRATION CONTROL SYSTEM

8.1.1 RESERVOIR GAS COLLECTION SYSTEM

1. The system performance requirements for the Reservoir Gas Collection System are summarized in Table 3 and the results from the first six months of OM&M are presented in Chapters 3.0, 4.0 and 5.0. The results indicate that minimal levels of organic vapors are being extracted from the reservoir system.
2. Methane influent levels were low at concentrations ranging from 88 to 380 ppmv, which is equivalent to 0.3 to 1.1 pounds per day of methane at the measured Reservoir Gas Collection System flow rate of approximately 50 scfm. This calculated daily methane emissions level is well below the 2.3 pounds per day, indicating the system could be converted to passive treatment at the end of one year of "active" operation if these low influent levels continue during the next 6-month reporting period.
3. The TGNMO inlet levels were low and ranged from non-detect to 3.2 ppmv as methane (i.e., equivalent to non-detect to 0.5 ppmv as hexane). Therefore, the TGNMO concentrations are well below the 20 ppmv basis as hexane for the system performance requirement.
4. The maximum total VOC inlet concentration from the Reservoir Gas Collection System was 130 ppbv based on the analytical data, which is equivalent to 0.002 pounds of VOCs per day at the measured flow rate of approximately 50 scfm and an average molecular weight of the constituents in the vapor stream estimated to be 150 pounds per pound mole. This VOC inlet rate is well below the SCAQMD performance requirement of one pound per day and, therefore, emission treatment and a permit will not be required if these low influent levels continue during the next 6-month reporting period.

8.1.2 IN-BUSINESS AIR MONITORING RESULTS (BUILDING MODIFICATIONS)

1. The system performance requirements for the Building Modifications are summarized in Table 3 and the results from the first six months of OM&M are presented in Chapters 3.0, 4.0 and 5.0. The results do not indicate that gas migration to in-business air locations is occurring.

2. The results presented in Chapter 5.0 indicate that the majority of the constituents analyzed were below the IATLs (e.g., methane and most of the VOCs). The results for two specific VOCs were above the IATLs in certain business locations (i.e., benzene in IBM-03B, IBM-22, IBM-37 and IBM-41, and PCE in IBM-37). The specific constituents reported above the IATLs are highlighted in Table 6.
3. The benzene concentrations that exceeded the IATL of 2.0 ppbv in the locations noted above ranged from 2.2 ppbv to 3.8 ppbv. Benzene concentrations have been detected at similar or higher concentrations in prior monitoring events at these locations and are likely associated with tenant activities as noted in the CTR (TRC, 2006c). Also, ambient air samples collected during the in-business monitoring events (IBM-24[AMB] and IBM-49[AMB]) contained benzene at levels of approximately 1 ppbv, which likely contributed to the measured in-business concentrations. If the background benzene level in ambient air is subtracted from the measured in-business air results, only one of the four business locations noted above would exceed the IATL of 2.0 ppbv (i.e., IBM-03B: $3.8 \text{ ppbv} - 1.0 \text{ ppbv} = 2.8 \text{ ppbv}$ benzene).
4. The PCE concentration that exceeded the IATL of 10.6 ppbv in location IBM-37 ranged from 32 to 170 ppbv. PCE concentrations have been detected at similar or higher concentrations in prior monitoring events at this location and are likely associated with tenant activities as noted in the CTR (TRC, 2006c).
5. As noted in Chapter 5.0, several VOC constituents were not detected but had reporting limits above IATLs. In most cases, the reporting limit was only slightly above the IATL and/or there was no historical data indicating prior elevated levels and, therefore, these results are unlikely to represent potential IATL exceedences. The exception to this was benzene in IBM-41, which has been identified with historical benzene exceedences slightly above the IATL at this sampling location.
6. The levels of TCE detected in each business location in the second of two sampling rounds performed during the Compliance Testing period and which were determined to be the result of ambient air contaminant conditions or laboratory contamination were not reported during this monitoring period.

7. Based on these results and the Decision Matrix for In-Business and Ambient Air Monitoring shown in Figure 7, the monitoring frequency will be reviewed after the first year of OM&M and may be revised to semi-annual.

8.1.3 SENTINEL BIOVENT SYSTEM

1. The Sentinel Biovent Well System is a secondary Gas Migration Control System for the WDI Site. Vapor samples were not collected from the biovent wells as their purpose is to provide air for natural biodegradation.
2. A semi-annual inspection was performed for each well during this reporting period to verify the integrity of well head components. The wellhead components and casings were found to be in good condition at the time of inspection.

8.2 LEACHATE MONITORING/CONTROL SYSTEM

1. The performance requirements for the Leachate Monitoring/Control System are summarized in Table 3 and the management strategy to reduce and maintain liquid levels is summarized in Chapter 3.0. Based on the results presented in Chapter 5.0, the liquids management strategy implemented during the first 6 months of OM&M was successful in reducing and/or maintaining the liquid levels in LC-1 and LC-3. The liquids in LC-2 and LC-4 continue to recover to levels requiring bailing twice per week.
2. The results in Chapter 5.0 indicate that liquids in LC-1 recover to over 1.0 foot but less than 3.0 feet between monitoring events and, therefore, this well will continue to be monitored and bailed at least weekly. Also, the liquids in LC-3 recover less than 1.0 foot between monitoring events and, therefore, this well will continue to be monitored once per week and bailed when the level exceeds 1.0 foot.
3. The liquid levels in LC-2 and LC-4 recover to over 3.0 feet between monitoring events and, therefore, these wells will continue to be monitored and bailed twice weekly. Also, an automated pumping system has been approved by EPA for these two wells and will be installed in the Fourth Quarter.

8.3 SOIL GAS MONITORING SYSTEM

8.3.1 VAPOR MONITORING WELLS

1. The system performance requirements for the vapor monitoring wells are summarized in Table 3. Historical data from previous vapor well monitoring events along with the results from the first six months of OM&M are presented in Chapter 5.0 and Table 8. The data in the table is separated for Compliance Vapor Wells (wells that have been historically below the SGPS) and Non-Compliance Wells (wells that have historically been above the SGPS for various constituents). The designations of Compliance and Non-Compliance Vapor Wells are described in Chapter 4.0.
2. The conclusions regarding the Compliance and Non-Compliance Vapor Well sampling performed during the first 6 months of the OM&M period are presented below.

8.3.1.1 Compliance Vapor Wells (VW-29 to -39, -41 and -42)

1. The methane results for the 25 nested Compliance Vapor Wells as noted in Chapter 5.0 were very low (e.g., maximum of 2.9 ppmv) or non-detect and are well below the SGPS limit of 5 percent (i.e., 50,000 ppmv). The TGNMO results were also low (e.g., maximum of 11 ppmv) and consistent with the VOC results. The VOC results were below SGPS limits, except as noted below. These results indicate that gas migration from the remaining wastes at the WDI Site is not occurring and/or is not significant. However, sub-surface biodegradation changes appear to be occurring, which may affect gas migration conditions as described below for benzene.
2. The results presented in Chapter 5.0 indicate that the majority of the VOC constituents were below the SGPSs. The analytical results for three specific VOCs in certain well locations were above the SGPSs (i.e., benzene in 14 locations, chloroform in one location and TCE in one location). The occurrences of the specific constituents above the SGPSs are discussed below.
3. Benzene was detected above the SGPS of 10.0 ppbv in 14 of the 25 Compliance Vapor Well locations (i.e., VW-29-S, VW-30-I, VW-34-S, VW-34-I, VW-34-D, VW-35-S, VW-35-D, VW-36-D, VW-37-D, VW-38-D, VW-39-D, VW-41-D, VW-42-S and VW-42-D) during this reporting period. Each of the exceedences occurred in the second round of monitoring, which occurred in March 2007, and none occurred in the first round of monitoring, which occurred in December 2006/January 2007. The benzene concentrations in these 14 wells

ranged from 11 to 130 ppbv and were above historical levels and prior exceedences except for one well. Five of these wells along with two others had benzene exceedences during the Compliance Testing period.

4. Based on the ambient air and QA/QC results, the benzene exceedences do not appear to be associated with ambient air conditions or laboratory handling/testing procedures. Although an ambient air sample was not collected from a Compliance Vapor Well location during the second round of monitoring, the ambient air sample collected during the first round at VW-42 and from in-business ambient air locations IBM-24(AMB) and IBM-49(AMB) during both rounds indicated ambient air benzene levels of only 1 to 2 ppbv. Duplicate samples were also collected and analyzed in four of the fourteen exceedence locations in the second round of monitoring and indicated comparable benzene results. Also, QA/QC results from Summa canister certifications and trip/field blanks analyzed during the first and second rounds were non-detect for benzene and other VOCs.
5. The reasons for benzene exceedences in the second round versus the first round of monitoring during this period are unknown. It is noted that benzene levels were also higher in the Non-Compliance Vapor Wells in the second round of monitoring as described below. Also, it is noted that influent samples analyzed from monthly monitoring of the Reservoir Gas Collection System indicated elevated concentrations of benzene occurred in the March 2007 sample (i.e., 79 ppbv) compared to the other months (i.e., 1.4 to 15 ppbv). This Reservoir Gas Collection System data indicates that significant changes in benzene levels emanating from the waste material were occurring during the same time period as the Second Quarter vapor well monitoring. These conditions will be monitored closely in subsequent monitoring events. As discussed below, the above conditions may be due to a change in organic decomposition processes (i.e., an increase in aerobic and decrease in anaerobic decomposition). Since aerobic decomposition occurs at a higher rate than anaerobic, a change/increase in soil gas migration may be occurring. This change may be moving soil gas including benzene from areas containing waste to non-waste containing areas (e.g., Compliance Well locations).
6. Chloroform was detected above the SGPS in well VW-35-D (i.e., 23 ppbv versus SGPS of 20 ppbv) during the second quarterly monitoring event. Although the chloroform level was above the SGPS, it has been detected historically in this well in the range of 12 to 50 ppbv (it was detected at 19 ppbv in the first quarter monitoring event). The levels have been 25 ppbv

or below since the Fourth Quarter 1999 monitoring event. The results are not indicative of a change in soil gas conditions at this well location relative to chloroform.

7. TCE was detected above the SGPS in well VW-35-D during the first and second quarter monitoring events (i.e., 680 ppbv and 750 ppbv, respectively, versus SGPS of 200 ppbv). Although the TCE level was above the SGPS, it has been detected historically in this well in the range of 14 to 1,700 ppbv and has exceeded SGPS levels in 14 of 15 monitoring events. The levels are generally trending downward. The results are not indicative of a change in soil gas conditions at this well location relative to TCE.
8. As noted in Chapter 5.0, several VOC constituents were not detected but had reporting limits above SGPSs. In most cases, the reporting limit was only slightly above the SGPS and/or there was no historical data indicating prior elevated levels and, therefore, these results are unlikely to represent potential SGPS exceedences. The exception to this was benzene in VW-35-D in the First Quarter with a reporting limit of 19 ppbv versus the SGPS of 10 ppbv. Benzene was detected in VW-35-D at 16 ppbv in the Second Quarter.
9. These constituents (i.e., benzene, chloroform and TCE) along with other VOCs will be monitored and further evaluated during subsequent long-term monitoring events.
10. The fixed gas results (e.g., nitrogen, oxygen, carbon monoxide, carbon dioxide and methane) indicate that the primary biodegradation mechanism near the Compliance Vapor Wells is likely aerobic due to the elevated carbon dioxide and nitrogen levels, reduced oxygen levels and relative absence of significant methane levels. Also, several wells exhibited trends of decreasing oxygen and increasing carbon dioxide levels after remedy implementation. Although methane levels were not significant and data for nitrogen, oxygen, carbon monoxide and carbon dioxide were not collected prior to remedy implementation, the fixed gases indicate an aerobic condition after implementation. This suggests the remedy may be supporting an increase in oxygen flow into the soil as a result of operation of the Reservoir Gas Collection System and biovent wells. Note that aerobic decomposition is a more rapid degradation process than anaerobic degradation. Thus, more gas generation/migration may be occurring now than prior to remedy implementation.
11. The frequency of monitoring Compliance Vapor Wells is based on the Decision Matrix Criteria for Soil Gas Monitoring Data shown in Figure 8. The monitoring frequency will be reviewed after the first year of OM&M activities and may be revised if appropriate.

8.3.1.2 Non-Compliance Vapor Wells (VW-25, -46, -49, -51, -55, -56, -58, -61 and -62)

1. The results for the Non-Compliance Vapor Wells sampled during the first six months of OM&M activities are discussed below. In general, constituent levels were similar or declining compared to prior events with some key exceptions (i.e., methane, benzene, and fixed gases).
2. Most of the 25 nested Non-Compliance Vapor Wells had results that showed similar methane levels as compared to Compliance Testing period results. Increases or decreases in levels in most wells were not significant. However, significant methane decreases, in some cases several orders of magnitude, were noted in a few wells after remedy implementation compared to prior to remedy implementation.(i.e., VW-25-D, VW-51-I, VW-51-D, VW-55-I, VW-62-I and VW-62-D).
3. Benzene levels were higher for the Non-Compliance Wells in the Second Quarter compared to the First Quarter and, in most cases, the Second Quarter benzene results were also higher than historical levels. Other constituents such as TCE, PCE, toluene, ethylbenzene and xylenes did not show this same pronounced trend.
4. Based on the ambient air and QA/QC results, the higher levels of benzene in the Second Quarter results do not appear to be associated with ambient air conditions or laboratory handling/testing procedures. Although an ambient air sample was not collected from a Non-Compliance Vapor Well location during the Second Quarter, the ambient air sample collected during the First Quarter at VW-62 and from in-business ambient air locations IBM-24(AMB) and IBM-49(AMB) during both rounds indicated ambient air benzene levels of only 1 to 2 ppbv. Duplicate samples were also collected and analyzed in five wells in the First and Second Quarters of monitoring and indicated comparable benzene results. Also, QA/QC results from Summa canister certifications and trip/field blanks analyzed during the First and Second Quarters were non-detect for benzene and other VOCs.
5. The reasons for benzene exceedences in the Second Quarter versus the First Quarter during this period are unknown. As noted previously, benzene levels were also higher in most Compliance Vapor Wells in the Second Quarter monitoring event. Also, it is noted that influent samples analyzed from monthly monitoring of the Reservoir Gas Collection System indicated elevated concentrations of benzene occurred in the March 2007 sample (i.e., 79 ppbv) compared to the other months (i.e., 1.4 to 15 ppbv). This Reservoir Gas Collection System data indicates that significant changes in benzene levels emanating from the waste material were occurring during the same time period as the Second Quarter vapor well

monitoring. These conditions will be monitored closely in subsequent monitoring events. Also discussed previously, the above conditions may be due to a change in organic decomposition processes (i.e., an increase in aerobic and decrease in anaerobic decomposition). Since aerobic decomposition occurs at a higher rate than anaerobic, a change/increase in soil gas migration may be occurring. This change may be moving soil gas including benzene from areas containing waste to non-waste containing areas (e.g., Compliance Well locations).

6. The fixed gas results indicate that the primary biodegradation mechanism near the Non-Compliance Vapor Wells is likely aerobic due to the elevated carbon dioxide and nitrogen levels, reduced oxygen levels and significant declines in some methane levels. Also, several wells exhibited trends of decreasing oxygen and increasing carbon dioxide levels after remedy implementation. However, elevated methane levels in some wells indicate anaerobic degradation at some locations may still be occurring in these areas. Although data for nitrogen, oxygen, carbon monoxide and carbon dioxide were not collected prior to remedy implementation, the fixed gases indicate a more aerobic condition after implementation. This suggests the remedy may be supporting an increase in oxygen flow into the soil as a result of operation of the Reservoir Gas Collection System and biovent wells. Note that aerobic decomposition is a more rapid degradation process than anaerobic degradation. Thus, more gas generation/migration may be occurring now than prior to remedy implementation.

8.3.1.3 Statistical Analysis of Soil Gas Results at Non-Compliance Vapor Wells

1. Section 4.6 provides a detailed discussion of the purpose and approach to statistical analysis of the Non-Compliance Vapor Wells. The primary purpose of statistical analysis is to identify statistically significant concentration changes of the 18 soil gas performance standard compounds. Statistically significant changes can be an indicator of important changes occurring in the soil gas following remedy implementation. The statistical analysis of the data was performed using the computer program DUMPStat.
2. The statistical analysis indicates control limit (Poisson or CUSUM) exceedences at 19 out of 25 Non-Compliance Vapor Wells. Statistically significant exceedences are summarized in Table 9.

3. There were 21 exceedences of the Poisson Prediction Limit and 19 exceedences of the CUSUM Limit during the First and Second Quarters.
4. Benzene exceeded a statistical limit in 16 of the 25 wells. Methane exceeded a limit in 7 of the 25 wells. Nine additional compounds accounted for the remaining 17 limit exceedences.
5. Although there is an absence of upward concentration trends of specific constituents in individual wells in the DUMPStat analysis, there is a sharp increase in the number of limit exceedences over time for various constituents (e.g., 5 exceedences during Compliance Testing period, 13 exceedences during the First Quarter and 27 exceedences during the Second Quarter). This condition may be associated with an overall change in the soil gas generation/decomposition process that is resulting in increased gas migration and associated variations in constituent concentrations. If increasing concentrations of specific constituents were occurring over time, significant upward trends for those specific constituents should have been identified in addition to limit exceedences for those same constituents. However, the number of limit exceedences for various constituents increased without corresponding upward trends for those same constituents. Section 5.3.3 discusses the possibility that the soil gas generation process may be transitioning from the slow anaerobic decomposition process that was present prior to remedy implementation to the more rapid aerobic decomposition process after implementation. This decomposition process change may be due to increases in oxygen to the subsurface from operation of the Reservoir Gas Collection System and the biovent wells. This transition in the degradation process may be causing a change in soil gas migration and soil gas constituent concentrations.
6. If soil gas constituent concentration changes continue to be statistically significant (i.e., increasing limit exceedences), indicate increasing decomposition process changes from anaerobic to aerobic, and/or indicate unacceptable migration of soil gas, it may be prudent to evaluate discontinuing operation of the Reservoir Gas Collection System in an active mode and to disconnect the one-way valves of the biovent wells for a period of time. During this time, the soil gas would be monitored for beneficial changes in regard to constituent concentrations, migration and decomposition processes.

8.4 SURFACE EMISSIONS AND OUTDOOR MONITORING

1. The system performance requirements for the two ambient air monitoring locations [IBM-24(AMB) and IBM-49(AMB)] are summarized in Table 3. Historical data from previous ambient air monitoring events along with the results from the first six months of OM&M activities are presented in Chapters 4.0 and 5.0.
2. The results presented in Chapter 5.0 and Table 6 indicate that the constituents analyzed were below the IATLs (e.g., methane and VOCs). The levels of TCE detected in one of the two sampling rounds performed during the Compliance Testing period and which were determined to be the result of ambient air contaminant conditions or laboratory contamination were not reported during this monitoring period.
3. Based on these results and the Decision Matrix for In-Business and Ambient Air Monitoring shown in Figure 7, the monitoring frequency will be reviewed after the first year of OM&M and may be revised if appropriate.

8.5 GROUND WATER MONITORING SYSTEM

1. The system performance requirements for ground water monitoring are summarized in Table 3 and the results from the first six months of OM&M are presented in Chapters 3.0, 4.0 and 5.0. The results indicate that remaining WDI waste contaminants are not migrating into the ground water.
2. The results of the ground water COC analyses are included in Table 10 along with historical results. The results above MCLs in Table 10 are highlighted. Manganese was detected above the MCL in six of the twelve Background, POC, Near-Source Detection and Verification Wells, indicating a regional ground water condition. PCE was detected above the MCL in one Background Well but not in other wells, indicating an upgradient contaminant source. Other VOCs were not detected in the wells with the exception of dibromochloroethane in one Verification Well. Dibromochloroethane is not a ground water COC.
3. Sections 4.6 and 5.4.2.6 discuss the approach to and results of statistical analysis of analytical data, respectively. The results indicate the ground water data to be in control, i.e., only two exceedances of a prediction limits occurred. The two prediction limit exceedances

occurred for manganese at wells GW-22 and GW-29. Manganese is a naturally occurring constituent in the regional ground water below the site.

4. The frequency of monitoring for ground water is based on the Decision Matrix Criteria for Ground Water Monitoring shown in Figure 9. Based on the analytical results during this first six months of OM&M, the monitoring frequency will be reviewed after the first year of OM&M and may be revised to annual.

8.6 STORMWATER MONITORING SYSTEM

1. The performance requirements for stormwater are summarized in Table 3 and the results from the first six months of OM&M are presented in Chapters 3.0, 4.0 and 5.0.
2. Stormwater sampling was not conducted during this monitoring period due to low rainfall events (e.g., less than 2 inches of rainfall in 24 hours). Routine inspections of monitoring points and stormwater drainage control systems were conducted during this reporting period and the results are presented in Chapter 3.0.

8.7 QUALITY ASSURANCE/QUALITY CONTROL

8.7.1 TRIP/FIELD BLANK AND BACKGROUND ANALYSIS RESULTS

1. The soil gas, in-business air, ambient air and ground water monitoring included Summa canister certifications and the analysis of trip/field blanks, equipment rinsate blanks, duplicates and collection and analysis of background ambient air samples during the First and Second Quarter monitoring and sampling activities. The results for these samples are presented in Chapters 5.0 and 6.0. The results indicated that Summa canister cleaning and handling procedures along with vapor and ground water sampling, collection and handling procedures did not result in contaminant introduction. Duplicate samples provided comparable results with only moderate variability and ambient air background samples confirmed the presence of only low levels of some VOCs below IATLs and SGPSs.

8.7.2 DATA VALIDATION

1. Pursuant to the QAPP, ten percent of the soil gas, in-business air, and ambient air Level III data and ground water Level II data from the First and Second Quarter monitoring events were validated. The validation results are presented in Chapter 6.0 and show that the

analyses conducted during the first six months of the OM&M period are useable. The data quality for the organic analyses was good and indicates that the data met general QA/QC requirements for critical elements.

2. A few organic results for the validated vapor samples required qualification due to holding times, increased/decreased instrument sensitivities in continuing calibration standards and matrix interferences. As noted previously, discrepancies exist in the QAPP regarding holding times for EPA Methods 3C and 25C and will be corrected in future monitoring events. The qualifiers are associated with only a few constituents (i.e., methane, TGNMO, vinyl chloride, trichlorotrifluoroethane, vinyl acetate, and PCE) and do not have a material effect on the monitoring results or conclusions herein.
3. The analytical results for the ground water sample that was validated did not require qualification.
4. The following corrective action/recommendations are provided to address the QA/QC data qualification items noted in this report and for future sampling events during the long-term OM&M phase:
 - The QAPP holding time discrepancy regarding EPA Methods 3C and 25C and will be corrected to be consistent with a 14 day holding period.

9.0 REFERENCES

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